

# **THE ROLE OF SELECTED DUTY-BEARERS IN REALISING THE RIGHT TO WATER OF CHILDREN (0–24 MONTHS) IN COLESBERG, NORTHERN CAPE, DURING THE NUTRITIONAL MANAGEMENT OF DIARRHOEA IN PRIMARY HEALTH CARE INSTITUTIONS**

**by**  
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## **DECLARATION**

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Susanna Snyman

Date: March 2016

## ABSTRACT

### THE ROLE OF SELECTED DUTY-BEARERS IN REALISING THE RIGHT TO WATER OF CHILDREN (0–24 MONTHS) IN COLESBERG, NORTHERN CAPE, DURING THE NUTRITIONAL MANAGEMENT OF DIARRHOEA IN PRIMARY HEALTH CARE INSTITUTIONS

**Introduction:** Diarrhoea and malnutrition are some of the main causes of death in children under the age of five years. They are especially prevalent in children from 0 to 24 months that are most vulnerable, since their immune systems are not yet fully developed. It is therefore crucial for their health to have access to adequate and safe water. There are various human rights instruments (both national and international) protecting children's human rights to water and health. Since children are not able to realise their own right to water, it is the role of duty-bearers to realise their right to water for them.

**Objectives:** The main aim of this study was to investigate whether selected duty-bearers were fulfilling their responsibilities towards the realisation of the right to water of children (0–24 months) residing in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions. The two broad objectives were to investigate if the child's right to safe and adequate water is being realised and to investigate the prevalence and management of diarrhoea in this study population.

**Methods:** In a cross-sectional observational survey with an analytical component, caregivers of children aged 0–24 months ( $n=123$ ) from the three feeder clinics of the hospital in Colesberg completed an interviewer-administered questionnaire. Eight nursing practitioners participated in semi-structured interviews. Concepts related to the perceptions, knowledge, attitudes and practices of caregivers and nursing practitioners with regard to the right to water of young children and the management of diarrhoea were investigated. Qualitative data was analysed inductively by identifying, coding and grouping emerging themes to enrich quantitative data obtained from the questionnaires.

**Results:** The children that had not experienced diarrhoea previously were significantly ( $p<0.05$ ) younger than those that had had diarrhoea (mean age 7 and 12 months respectively). It was highly significant ( $p<0.05$ ) that those caregivers that knew what oral rehydration treatment (ORT) was, were also able to explain how to mix ORT correctly. Statistical significant ( $p<0.05$ ) differences were found between the prevalence of diarrhoea in children (mean age 4.8 months) that were eating complementary foods and younger infants who were not yet receiving complementary foods. Caregivers perceived the lack of a constant water supply as a barrier in realising the right to water of their children. Nursing practitioners perceived the intermittent water supply, the poor quality of the water and the caregivers' actions as barriers to realising the right to water of children. Nursing practitioners were knowledgeable about the management of diarrhoea as well as the treatment and prevention of dehydration.

**Conclusion:** It was found that caregivers and nursing practitioners were fulfilling their role as duty-bearers to the best of their ability in realising the right to water of children but faced several challenges. On behalf of Government as the primary duty-bearer, the municipal government should do more in realising the right to water of children. Recommendations included more education for caregivers with regard to what they can do to realise the right to water of their children 0–24 months with limited resources.

## OPSOMMING

### DIE ROL VAN GESELEKTEERDE PLIGTEDRAERS IN DIE VERWESENLIKING VAN DIE REG TOT WATER VIR KINDERS (0–24 MAANDE) IN COLESBERG, NOORD-KAAP, TYDENS DIE VOEDINGSBEHANDELING VAN DIARREE IN PRIMÊRE GESONDHEIDSORG INSTELLINGS

**Inleiding:** Diarree en wanvoeding van kinders tussen 0 en 24 maande is twee van die hooforsake van sterftes. Dit is dus noodsaaklik vir hul gesondheid dat kinders toegang sal hê tot voldoende en veilige water. Daar is verskeie menseregte instrumente (beide nasionaal en internasionaal) wat kinders se mensereg tot water en gesondheid beskerm. Dit is die rol van pligtedraers om die reg tot water van kinders namens hulle te realiseer.

**Doelwitte:** Die hoof doelwit van hierdie studie was om ondersoek in te stel of geselekteerde pligtedraers hulle verpligtinge met betrekking tot kinders (0 – 24 maande) wat in Colesberg, Noordkaap woon, nakom. Dit is veral nodig om hulle reg tot water te verwesentlik tydens die voedingsbehandeling van diarree in primêre gesondheidsorg instellings. Die twee breë doelwitte was om vas te stel of die kind se reg tot veilige en voldoende water verwesentlik word en om vas te stel wat die voorkoms en behandeling van diarree in hierdie studie populasie is.

**Metode:** 'n Deursnit waarnemende opname met 'n analitiese komponent is uitgevoer by die drie voederklinieke van die hospitaal in Colesberg. Versorgers met kinders 0 – 24 maande oud ( $n=123$ ) het vraelyste wat deur die navorser geadministreer was, voltooi. Agt verpleegkundiges het aan semi-gestruktureerde onderhoude deelgeneem. Konsepte wat gehandel het oor die persepsies, kennis, houding en praktyke van versorgers en verpleegkundiges met betrekking tot die reg tot water van jong kinders en die behandeling van diarree was ondersoek. Data analise van kwalitatiewe data is uitgevoer deur ontwikkelende temas te identifiseer, kodeer en groepeer op 'n induktiewe wyse om die kwantitatiewe data wat uit die vraelyste verkry is, te verryk.

**Resultate:** Die kinders wat nooit vantevore diarree gehad het nie was beduidend ( $p<0.05$ ) jonger as diegene wat vantevore diarree gehad het (gemiddelde ouderdom 7 en 12 maande respektiewelik). Dit was hoogs beduidend ( $p<0.05$ ) dat die versorgers wat geweet het wat die “orale rehidrasie oplossing (ORO)” was, ook in staat was om te verduidelik hoe om ORO korrek aan te maak. Statisties beduidende ( $p<0.05$ ) verskille was gevind tussen die voorkoms van diarree in kinders (gemiddelde ouderdom 4.8 maande) wat alreeds komplementêre voedsel eet en jonger babas wat nog nie komplementêre voedsel ontvang het nie. Versorgers was van mening dat die gebrek aan 'n konstante watervoorsiening 'n hindernis is in die verwesentliking van hul kinders se reg tot water. Verpleegkundiges het die wisselvallige watervoorsiening, die water se swak kwaliteit en die versorgers se aksies as hindernisse vir die verwesentliking van die reg tot water van kinders beskou. Verpleegkundiges was kundig oor die behandeling van diarree asook oor die behandeling en voorkoming van dehidrasie.

**Gevolgtrekking:** Daar was gevind dat versorgers en verpleegkundiges as pligtedraers hulle rol in die verwesentliking van kinders se reg tot water na die beste van hulle vermoë vervul het. As verteenwoordiger van die Staat as primêre pligtedraer behoort die munisipale regering meer te doen om die reg tot water van kinders te verwesentlik. Dit word aanbeveel dat meer opleiding aan versorgers gegee word met betrekking tot hul rol om die reg tot water van hulle kinders (0-24 maande oud) te verwesenlik wanneer hulpbronne beperk is.

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## **CONTRIBUTIONS BY PRINCIPAL RESEARCHER AND FELLOW RESEARCHERS**

The principal researcher (Susanna Snyman) developed the idea and the protocol. The principal researcher planned the research, undertook data collection (with the assistance of a research assistant), captured the data for analyses, analysed the data with the assistance of a statistician, interpreted the data, and drafted the thesis. Mrs Nelene Koen and Mrs Maritha Marais (supervisors) provided input at all stages and revised the protocol and thesis. Language and technical editing was done by Dr Elizabeth van Aswegen.



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## **LIST OF ACRONYMS AND ABBREVIATIONS**

ANOVA	Appropriate Analysis of Variance
CRC	The Convention on the Rights of the Child
EBF	Exclusive Breastfeeding
HIV	Human Immunodeficiency Virus
ICESCR	International Covenant on Economic, Social and Cultural Rights
IMCI	Integrated Management of Childhood Illnesses
INP	Integrated Nutrition Programme
IYCF	Infant and Young Child Feeding
ORT	Oral Rehydration Treatment
RtHB	Road to Health Booklet
SASSA	South African Social Security Agency
SOP	Standard Operating Procedures
TB	Tuberculosis
UNICEF	United Nations Children's Fund
WHO	World Health Organization

## LIST OF DEFINITIONS

Attitude	A settled way of thinking or feeling. <sup>1</sup>
Behaviour	The way in which someone behaves or conducts him or herself. <sup>1</sup>
Complementary feeding	Giving a child other foods (solid or semi-solid) in addition to breastfeeding or replacement feeding to meet the baby's nutrient requirements from 6 months of age. <sup>2</sup>
Duty-bearers	With any human right, there is a corresponding set of duties / responsibilities held by duty-bearers. <sup>3</sup>
Exclusive breastfeeding	Feeding a child through only breastfeeding, giving no other liquids or solids, not even water, with the exception of prescribed drops or syrups consisting of vitamins and mineral supplements or medicines, and expressed breastmilk. <sup>2</sup>
General Comment	To explain each right as it is intended in the ICESCR, the Committee on Economic, Social and Cultural Rights published its interpretation of the content of human rights provisions, in the form of General Comments on thematic and processual issues relevant to the realisation of the human rights provision in question. <sup>4</sup>
Malnutrition	An abnormal physiological condition caused by deficiencies, excesses or imbalances in energy, protein and/or other nutrients. <sup>2</sup>
Mixed feeding	Feeding both breast milk and other foods or liquids to a child younger than 6 months of age. <sup>2</sup>
Perception	A way of understanding or interpreting something. <sup>1</sup>
Rights holders	The rights holder is the person that is entitled to that specific human right. <sup>3</sup>

## **CHAPTER 1: LITERATURE REVIEW AND RATIONALE FOR THE STUDY**

## **1.1 BACKGROUND:**

Diarrhoea, pneumonia and malnutrition are some of the major causes of death among children under the age of five. Child deaths remain a critical problem in South Africa, which currently lags behind the Millennium Development Goal on reducing child mortality.<sup>5, 6</sup>

The highest rates of under-five mortality continue to be in sub-Saharan Africa, where one in nine children die before the age of five.<sup>7</sup> Furthermore, children aged 0–24 months are the most vulnerable group in any given population.<sup>8</sup> Their immune systems are not yet fully developed and it is therefore crucial for them to have access to clean, safe water.<sup>8</sup>

Water is a resource that is naturally available and it is also one of the most essential resources of the world.<sup>9</sup> Water is an essential nutrient necessary for human life and without water, a human being will not be able to survive.<sup>10</sup> Water is “an essential component of all body tissues”. The body is not able to store water and therefore the water that the body loses over a period of 24 hours must be replaced to maintain health and normal bodily functions. Infants have even higher requirements than adults and older children because their kidneys have a limited capacity to handle the renal solute load, they have a higher percentage of body water, and they have a large surface area per unit of body weight.<sup>11</sup> Humans need water for drinking, cooking, sanitation, and hygiene purposes, to wash dishes and clothes, and to grow food.<sup>4</sup>

Water is a basic human right and the right to water is protected in several human rights documents<sup>12,13,14</sup>, as well as the South African Constitution.<sup>15</sup> If people don't have access to clean, safe water, then their basic human needs cannot be fulfilled. The next two sections will describe international and national human rights instruments relevant to this thesis and other documents important for their realisation.

## **1.2 HUMAN RIGHTS INSTRUMENTS THAT PROMOTE THE REALISATION OF THE RIGHT OF THE CHILD TO ADEQUATE WATER**

### **1.2.1 International human rights instruments**

There are several human rights instruments that support the rights of the child in terms of the right to water.

The Universal Declaration of Human Rights (1948) does not refer directly to the right to water, but it is implied. In Article 25 it states that “everyone has the right to a standard of living adequate for the health and wellbeing of himself and his family, including food, clothing, housing...”<sup>16</sup>

The International Covenant on Economic, Social and Cultural Rights (ICESCR) (1966) concurs. In Article 11 it states that “everyone has the right to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions”.<sup>12</sup> In Article 12 it states that it is recognised that “everyone is entitled to the highest attainable standard of physical and mental health”.<sup>12</sup>

To explain each right as it is intended in the ICESCR, the Committee on Economic, Social and Cultural Rights published its interpretation of the content of human rights provisions, in the form of General Comments on thematic and processual issues relevant to the realisation of the human rights provision in question.<sup>4,17-20</sup> In General Comment 15 on the right to water, issued in 2002 by the UN Committee on Economic, Social and Cultural Rights (ECSR), the right to water is explained as follows: “The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements.”<sup>4</sup> Article 11, Paragraph 1, of the Covenant specifies a number of rights emanating from, and indispensable to, the realisation of the right to an adequate standard of living “including adequate food, clothing and housing”.<sup>12</sup>

The use of the word ‘including’ indicates that this catalogue of rights was not intended to be exhaustive. The right to water clearly falls within the category of guarantees essential for securing an adequate standard of living, particularly since it is one of the most fundamental conditions for survival.

The right to water is also inextricably related to the right to the highest attainable standard of health (Article 12, Paragraph 1) and the rights to adequate housing and adequate food (Article 11, Paragraph 1). The right should also be seen in conjunction with other rights enshrined in the International Bill of Human Rights, foremost among them the right to life and human dignity.<sup>12</sup> In General Comment 3 on the nature of states parties’ obligations (Article 2(1) of the Covenant), issued in 1990 by the UN Committee on Economic, Social and Cultural Rights (ECSR), it states in Paragraph 12 that “even in times of severe resource constraints ... the vulnerable members of society can and indeed must be protected by the adoption of relatively low-cost programmes”.<sup>17</sup> Although this statement does not directly refer to the right to water, one can deduce that it indirectly refers to the right to water.<sup>4,17</sup>

The Convention on the Rights of the Child (CRC) (1989) Article 24 (2(c)) states that all states shall take appropriate measures “to combat disease and malnutrition, including within the framework of

primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution”.<sup>13</sup>

It is not only in the documents of the United Nations that the right to water is included but also in the African Charter on the Rights and Welfare of the Child (1990). In Article 24(2)(c) it states that “States Parties to the present Charter shall undertake to pursue the full implementation of this right and in particular shall take measures to ensure the provision of adequate nutrition and safe drinking water”.<sup>14</sup>

### **1.2.2 National human rights instruments, regulations and standards**

Although South Africa had only ratified<sup>a</sup> the International Covenant for Economic, Social and Cultural Rights (1966)<sup>12</sup> in January 2015,<sup>21</sup> South Africa has one of the most comprehensive Constitutions (1996)<sup>15</sup> in terms of Economic, Social and Cultural Rights. The approach followed by the South African courts is that they must apply the Constitution and not the applicable international conventions, but that those international conventions can assist them in interpreting the Constitution.<sup>b</sup> Provisions of the Constitution will therefore be discussed in the light of applicable international conventions.

Section 27(1(a) and (b)) of the Constitution of the Republic of South Africa (SA) states that “Everyone has the right to have access to health care services”, and “Everyone has the right to have access to sufficient food and water”.<sup>15</sup> In Section 28 (1(c)) where the rights of children are addressed water is not mentioned but it states that “every child has the right to basic nutrition, shelter, basic health care services and social services”.<sup>15</sup> Since this is what the Government of South Africa would like to achieve, it is necessary to have minimum standards in place to be able to measure if this section of the Constitution is adhered to. The Department of Water Affairs and Forestry has provided a “framework within which local government can provide efficient, affordable, economical and sustainable access to water supply and sanitation”. This was published as the “Guidelines for Compulsory National Standards (Regulations under Section 9 of the Water Services Act (Act 108 of 1997)) and Norms and Standards for Water Services Tariffs (Regulations under Section 10 of the Water Services Act (Act 108 of 1997)) and Water Services Provider Contract Regulations in Terms of S19 (5) of the Water Services Act, 1997”. According to this document, “the minimum standard for basic water supply services is – the provision of appropriate education in respect of effective water use; and a minimum quantity of potable water of 25 litres

<sup>a</sup> The ICESCR was signed 3 October 1994 and was ratified 12 January 2015.<sup>21</sup>

<sup>b</sup>Section 39(1)(b) of the Constitution provides that in interpreting the Constitution, a court must take international law into account; see *S v Makwanyane* 1995 3 SA 391 (CC).<sup>22</sup> See also *Government of the RSA v Grootboom* 2001/11 SA 46 (CCT).<sup>23</sup>

per person per day or 6 kilolitres per household per month – at a minimum flow rate of not less than 10 litres per minute; within 200 metres of a household; and with an effectiveness such that no consumer is without a supply for more than seven full days in any year”. These regulations and guidelines were introduced to ensure that all South Africans have equal access to water services.<sup>24</sup>

Section 9 of the Constitution that deals with equality states that “the state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth”.<sup>15</sup> This can be interpreted that every citizen must be treated equally and that everyone must receive the same treatment. This is, however, easy to proclaim, but the question is, whether it is being implemented. Regardless of whether it is intentional or not, it is usually the most vulnerable groups, in this instance 0–24-month-olds, which suffer the most.

In 2000, the Millennium Development Goals (MDG's) were adopted by 189 countries, including South Africa. These MDGs included eight goals, and goal number seven was to “Ensure Environmental Sustainability”, with a sub-goal to “Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation”.<sup>25</sup> In South Africa's progress report of 2013 to the United Nations it had been reported that the “proportion of the population using an improved drinking water source” had been achieved and that the “proportion of the population using an improved sanitation facility” would most likely be achieved by 2015.<sup>25</sup> South Africa also has the National Development Plan (NDP) that “aims to eliminate poverty and reduce inequality by 2030”. It has various enabling milestones towards reaching this goal. One of these milestones is to “ensure that all South Africans have access to clean running water in their homes”.<sup>26</sup>

### **1.3 HUMAN RIGHTS THAT HAVE AN IMPACT ON THE REALISATION OF THE RIGHT OF THE CHILD TO WATER**

All human rights are universal, interdependent, interrelated and indivisible<sup>27</sup> and in the context of the right to water, it is essential to consider the link to the right to education and the right to health.

#### **1.3.1 The right to education**

In the International Covenant on Economic, Social and Cultural Rights, Article 13(1), it is stated that “the States Parties to the present Covenant recognize the right of everyone to education”.<sup>12</sup> They agree that education shall be directed to the full development of the human personality and the sense of its dignity, and shall strengthen the respect for human rights and fundamental freedoms”.<sup>28</sup> This right, among others, is also included in the Constitution of the Republic of South

Africa and Section 29(1(a)) states that “everyone has a right to basic education...”<sup>15</sup> For the purpose of this study, this right will be interpreted as: Everyone is entitled to basic knowledge and education regarding the use and handling of water, specifically during water shortages and when water is considered unsafe, and this should include providing them with coping strategies for these scenarios. In a systematic analysis by Gakidou et al. in 2010, it was found that there is a correlation between the education of women and the reduction in child mortality.<sup>29</sup> Caregivers<sup>c</sup> who have a higher education will probably have a better knowledge of the correlation between water and gastro-intestinal illnesses and will possibly be better equipped to treat water to prevent illnesses; they will also act sooner and seek help and therefore more child deaths may be prevented. In an article written by Boyle et al. in 2006, it was found that providing maternal education may play a role in improving child health by improving the care the child receives at home as well as the utilisation of preventative and treatment options that are available at health care facilities.<sup>30</sup>

### 1.3.2 The right of the child to health

The right to health is mentioned in the Convention on the Rights of the Child in Article 24(1): “States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health.”<sup>13</sup> The Convention on the Rights of the Child does not only focus on health but also on education and knowledge. It states in Article 24(2(e)) that “States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures: To ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition, the advantages of breastfeeding, hygiene and environmental sanitation and the prevention of accidents”.<sup>13</sup>

The right to health is also mentioned in Section 27(1(a)) of the SA Constitution where it states that “everyone has the right to have access to health care services...”<sup>15</sup> In Section 28 (1)(c) it is stated that “every child has the right to basic nutrition, shelter, basic health care services and social services”.<sup>15</sup>

The Department of Health has various policies, programmes and guidelines in place to assist in realising the right to health, especially for children. The Integrated Nutrition Programme of 1995 was introduced and implemented to focus on preventing and treating childhood illnesses through proper nutrition guidelines.<sup>31</sup> These policies, programmes and guidelines include, but are not limited to, the Roadmap for Nutrition in South Africa 2013–2017<sup>2</sup>, the guidelines for the Integrated Management of Childhood Illnesses (IMCI)<sup>32</sup> and the Road to Health Booklet.<sup>33</sup> The Strategic Plan

<sup>c</sup> A caregiver is anyone who provides care to a child. It can be a parent, a grandparent, or another family member or a foster parent.<sup>34</sup>



for Maternal, Newborn, Child and Women's Health (MNCWH) and Nutrition in South Africa (2012–2016) was adopted in 2012 by the National Department of Health of South Africa. These strategies focus on maternal health, newborn health, child health, women's health and community interventions to prevent and reduce maternal and childhood mortality. These include both preventative measures, for example, immunisations, and curative measures, for example, “improved hospital care for ill children especially for those with common conditions (pneumonia, diarrhoea and severe malnutrition) using standardised protocols”.<sup>35</sup>

The Roadmap for Nutrition includes strategies to prevent and treat childhood conditions like diarrhoea and malnutrition. These strategies include “exclusive breastfeeding promotion” and the promotion of “improved hygiene practices like hand washing”. It also recognises the “impact of social determinants of nutrition, especially improving access to basic services such as clean water and adequate sanitation” on the health of children.<sup>2</sup>

The IMCI guidelines provide nursing practitioners and other health care workers with a detailed treatment plan to treat various childhood illnesses, for example, diarrhoea and dehydration.<sup>32</sup>

The Road to Health Booklet was first introduced in 2011 to replace the previous Road to Health Chart (RtHC). Since 1995, South Africa's RtHC has been revised four times and the growth standards used were based on a 30-year-old study conducted in the USA. The Road to Health Booklet contains growth charts founded on the World Health Organization (WHO) growth standards which are based on the growth standards of breastfed babies.<sup>36</sup> The Road to Health Booklet is issued to all new-born babies and assists health care professionals to document the healthcare history of a child from birth onwards. The Road to Health Booklet is an important clinical tool for high-quality paediatric primary care — allowing the opportunity to record and monitor key information, including growth and development, immunisations, vitamin A supplementation, deworming, Tuberculosis (TB) status, PMTCT (prevention of mother-to-child transmission) and Human Immunodeficiency Virus (HIV) testing, growth charts, infant and young child feeding information and information on hospital admissions. It also contains key health promotion messages. These messages focus mostly on the feeding of children from 0–6months, 6–12 months and 12 months to 5 years. It includes the types of foods each of these age groups needs. The recipe for the oral rehydration solution<sup>d</sup> is included, as well as feeding recommendations for when children have diarrhoea.<sup>33,36</sup>

Therefore, if the above-mentioned rights are not fulfilled, and the policies, programmes and guidelines are not adequately implemented and enforced, it can have serious consequences for the health, optimal growth and development of the child.

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<sup>d</sup> Recipe for oral rehydration solution: 1 litre of cooled, boiled water plus 8 level teaspoons of sugar and ½ a teaspoon of salt.<sup>35</sup>

## 1.4 POSSIBLE CONSEQUENCES WHEN THE RIGHT TO WATER, HEALTH AND EDUCATION IS NOT FULFILLED

If General Comment 15(6) on the right to water, issued in 2002 by the UN Committee on Economic, Social and Cultural Rights (ECSR) is viewed, one realises that

...water is required for a range of different purposes, besides personal and domestic uses, to realize many of the Covenant rights. For instance, water is necessary to produce food (right to adequate food) and ensure environmental hygiene (right to health). Water is essential for securing livelihoods (right to gain a living by work) and enjoying certain cultural practices (right to take part in cultural life). Nevertheless, priority in the allocation of water must be given to the right to water for personal and domestic uses. Priority should also be given to the water resources required to prevent starvation and disease, as well as water required to meet the core obligations of each of the Covenant rights.<sup>4</sup>

Govender et al. qualify that “water has two contrasting roles affecting health: it can be a disease vector by carrying pathogens, and it can prevent disease when it is available in sufficient quantity for personal and domestic hygiene”<sup>37</sup> (*Figure 1.1*). Therefore it can be concluded that when safe water is not available it will have a negative impact on food security and food availability.

### 1.4.1 Diarrhoea and malnutrition as a consequence of violated rights

One of the many problems that could occur when safe water is not present is diarrhoea. Diarrhoea can be caused by bacterial, viral or parasitic infections, underlying malnutrition, unsafe, contaminated water or poor personal hygiene. Infants, children and people with a weakened immune system, caused by the HIV and TB patients, cancer patients as well as pregnant women, can be more prone to diarrhoea.<sup>37</sup> The pathogens impair intestinal absorption and that in effect can cause diarrhoea; both of these occurrences can lead to impaired nutritional status. If a child therefore has frequent bouts of diarrhoea it can affect nutrient absorption, which can then cause malnutrition. This can have a lasting effect on the growth and development of a child.<sup>38</sup> In an editorial by Van Niekerk in 2012, the author mentions that there are some important guidelines to remember with regard to the prevention of diarrhoea. The most important ones include: exclusive breastfeeding; rotavirus immunisation for all babies; proper hand-washing techniques; safe water; and safe disposal of waste.<sup>40</sup>

Diarrhoea can also cause malnutrition, and malnourished children are more prone to diarrhoea. According to Nel in 2010, there are quite a few factors that can contribute to the effect that diarrhoea has on the nutritional status of children. These can include reduced food intake due to poor appetite, poor absorption of nutrients and the loss of nutrients and electrolytes.<sup>41</sup> A report compiled by the WHO, outlined a 7-point plan to treat and prevent diarrhoea. This included, for treatment, “fluid replacement to prevent dehydration and zinc treatment”. The strategies to prevent diarrhoea were “rotavirus and measles vaccinations, promotion of early and exclusive breastfeeding and vitamin A supplementation, promotion of hand washing with soap, improved

water supply quantity and quality, including treatment and safe storage of household water, and community-wide sanitation promotion".<sup>42</sup>

According to a series in the *Lancet* in 2008, under-nutrition can have various consequences including stunting, weaker intellectual development and higher morbidity. Globally it is accountable for 35 percent of deaths of children under the age of five years.<sup>43</sup> If diarrhoea impacts on the nutritional status of children, then it can be deduced that diarrhoea can have an impact on the quality of life of children and it can also greatly impact on their health.

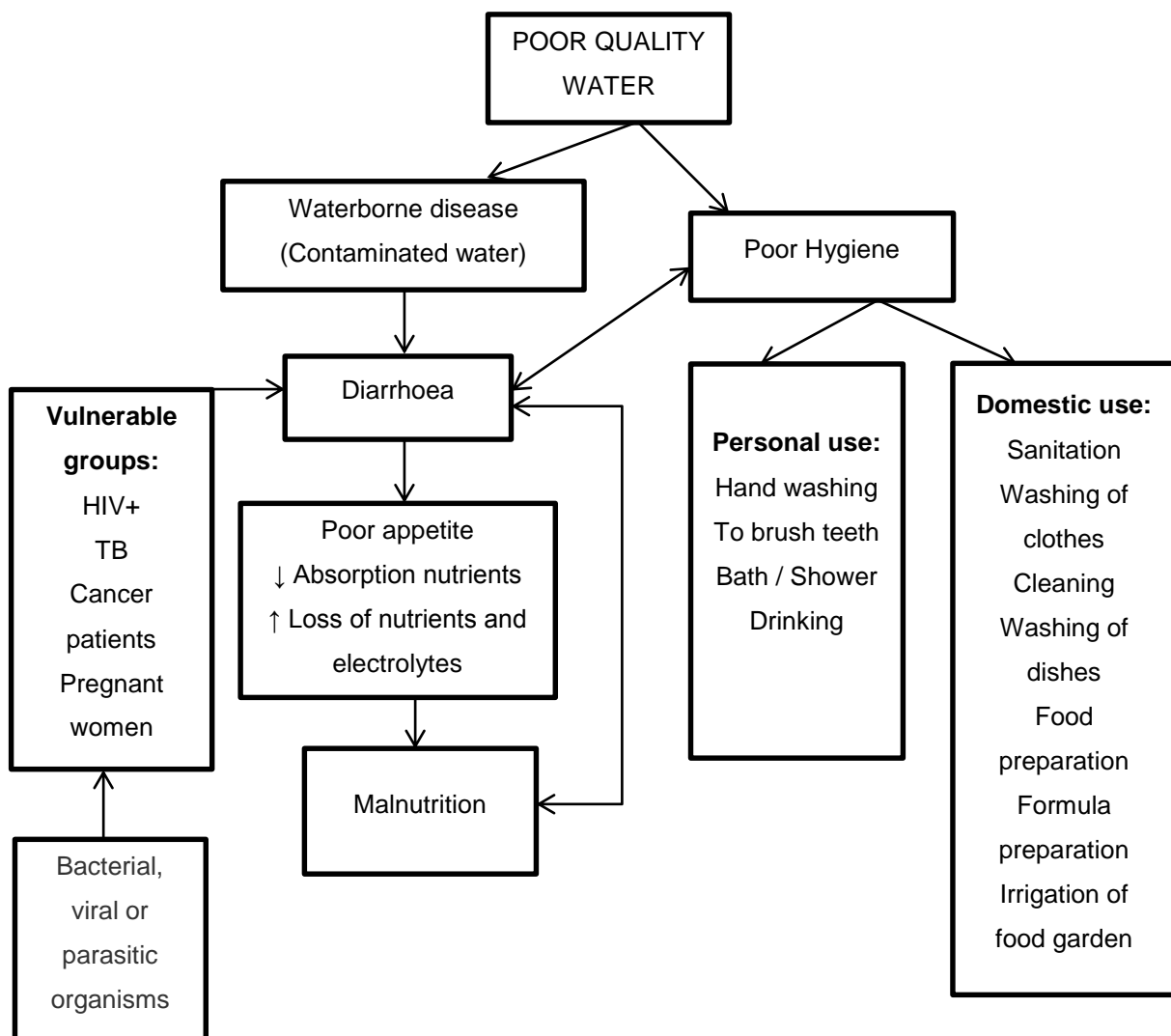


Figure 1.1: Framework depicting the consequences of poor-quality water<sup>37-39</sup>

## 1.5 RATIONALE FOR THE STUDY

Colesberg is a small rural town in the Northern Cape with 17,354 inhabitants.<sup>44</sup> Although Colesberg is situated approximately 40 kilometres from the Gariep Dam, the town has experienced frequent problems with its water supply. There were times during the day when there was no water due to

an inefficient supply system that were unable to meet the high demand for water. There were also occasions when the town was without water for extended periods of time due to faulty equipment. Several reports in the *Volksblad* in 2009, 2011 and 2012, reported on numerous water problems for example, when the water pump had fallen into the Orange River in November 2012. During that time the town was without running water for approximately two to three weeks.<sup>45-48</sup>

According to the Blue Drop<sup>e</sup> report of 2012 on the quality of drinking water, the Umsobomvu Municipality (including the towns of Colesberg, Noupoot and Norvalspont) scored the lowest of all in the Northern Cape municipalities with a score of 15.76%.<sup>49</sup> The report further states that the Department of Water Affairs is especially concerned about the vulnerable people who have to consume this water, since microbiological parameters exceed the national standard limits at times. The Department of Water Affairs issued a warning to the public in 2012 not to consume any tap water unless it is treated at home, either by boiling the water or adding bleach to the water.<sup>49</sup> The report stated that: "This warning will remain in place until an official announcement is made by the municipality in proving the contrary." No evidence was found that this statement had been revoked. It has been found that information is an important intervention that can form public perceptions of drinking-water safety. Where the water quality is suspected to be microbiologically compromised, it can be beneficial to make information known about the quality of the water and this may promote the home treatment of water.<sup>50</sup>

It can be argued that the right to water is currently not met for the population of Colesberg, even though it might be regarded that local government is complying with Section 27(2) of the Constitution of South Africa, should they be working on progressively realising the right to water in this area.<sup>15</sup> At present, however, it is necessary to have alternative measures in place until the water problem is resolved.<sup>f</sup> These measures could include, amongst others, the correct storage of water when there is no water supply as well as proper education on hygiene practices and sanitation in respect of the population affected.

South Africa is a country that is known for its unequal distribution of resources; however in the case of Colesberg everyone suffers equally when there is no water or when the water is unsafe. It is not only drinking water that is affected, but also water used for preparing food, water for growing food gardens, etc. Therefore, the right to water as well as the right to food/food security is affected.

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<sup>e</sup> "The Blue Drop Certification Programme is an innovative means to regulation which was designed and implemented with the core objective of safeguarding the tap water quality management." Each municipality had to provide a portfolio of evidence with certain key requirements. These include: Water safety planning (35% weighting); Drinking-water quality process management & control (10% weighting); Drinking water quality compliance (30 % weighting); Management, accountability, & local regulation (10% weighting); and asset management (15% weighting).<sup>49</sup>

<sup>f</sup> See the interpretation of Section 27(2) in the judgment in *Minister of Health v Treatment Action Campaign* 2002 5 SA 721 (CC).<sup>51</sup>

According to the South African National Health and Nutrition Examination Survey (SANHANES-1) in 2012, the 0–24 month population and those living in rural areas are the most at risk of malnutrition in South Africa.<sup>8</sup> Colesberg has a relatively large 0–24 month population, and in view of the above- mentioned information, it was decided to focus the study on this particular population group.<sup>52</sup>

The rate<sup>9</sup> of exclusive breastfeeding for 2011 and 2012 in Colesberg is reported at 36%.<sup>52</sup> Consequently a large number of babies are formula fed and it cannot be assumed that infants will benefit from the natural protection against malnutrition and diarrhoea provided by exclusive breastfeeding. According to Coutoudis in an article by Bloemen for UNICEF in 2012, “infant formula is not equivalent to breast milk; it does not contain all the essential nutrients or antibodies to protect children from diarrhoea, pneumonia or malnutrition ... Formula does not only increase infants’ vulnerability to disease; it could also be dangerous if mixed with unsafe water. In poor settings, they actually die from formula”.<sup>5</sup> In a study in the predominantly rural district of Hlabisa, KwaZulu- Natal, South Africa (2010), cumulative three-month mortality in exclusively breastfed infants was 6.1% versus 15.1% in infants given replacement formula, despite the fact that the women opting not to breastfeed were of higher socio-economic status.<sup>53</sup>

### **The nature of human rights obligations**

It is implied in most of the human rights instruments that there are various actors that play a role in contributing to realise human rights. For the purpose of this study the focus was mostly on Economic and Social Rights. Eide (1989) had introduced the categories of obligations to respect, to protect and to fulfil in a study titled *Right to Adequate Food as a Human Right*.<sup>54</sup> The obligation to respect requires state parties to not do anything to keep people from the enjoyment of their human right. The obligation to protect requires state parties to prevent third parties to keep people from the enjoyment of their human right. The obligation to fulfil is divided into the obligation to facilitate and the obligation to provide. The obligation to facilitate requires the state to take measures to help people to enjoy their human right. The obligation to provide requires the state to step in when people are unable to realise the right on their own, owing to their lack of resources or capacity.<sup>4,18</sup>

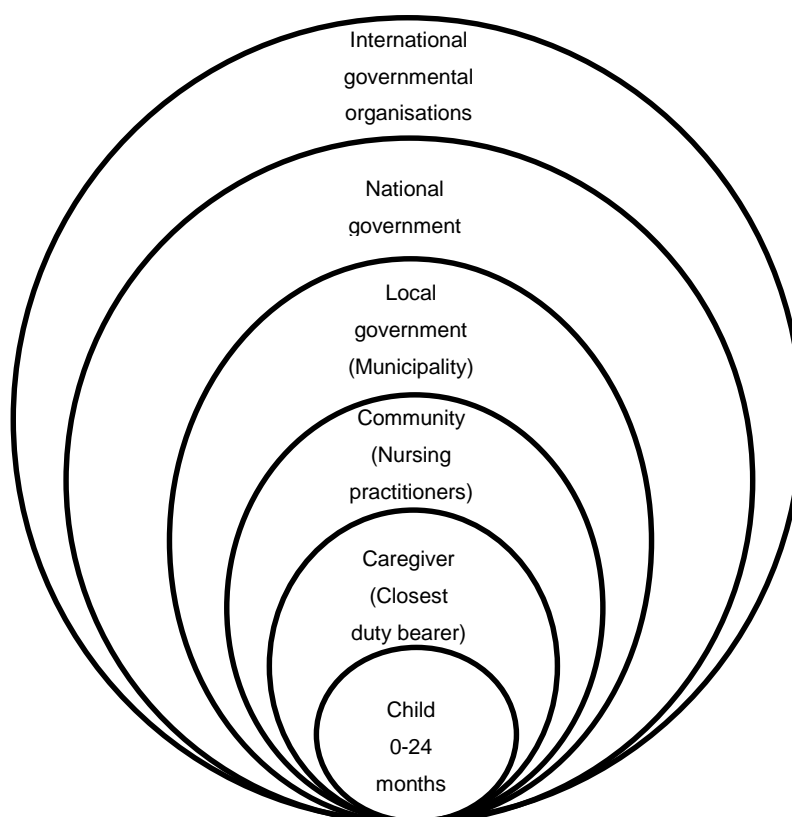
The levels of obligations were incorporated in General Comment no. 12 on the Right to Food<sup>18</sup> and since then also incorporated in other General Comments<sup>4,17-20,28</sup> as well as in the Constitution of the Republic of South Africa.<sup>15</sup> This applies to all human rights situations and must be adapted to the given circumstances in defining the form the different obligations will take under these. In the

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<sup>9</sup> Exclusive breastfeeding (EBF) is defined as when a mother gives nothing else than breast milk for the first six months. However, this data is collected at 14 weeks of age, when the children come for their HepB3 immunisation.<sup>52</sup>

instance where children (0–24 months) are concerned they need duty-bearers to realise these obligations on their behalf because they cannot provide for themselves.

George Kent published a paper on “The roles of international organizations in advancing nutrition rights” where he introduced the concept of nested layers of responsibility towards vulnerable individuals such as the infant. The responsibility hierarchy is presented as a set of nested circles, with the child in the centre of the nest, “surrounded, supported, and nurtured” by parents, family, community, non-governmental organisations, local government, national government, international non-governmental organisations and international governmental organisations<sup>55</sup> (*Figure 1.2*). The role of the different duty-bearers with regard to fulfilling the right to water of children (0–24 months) will therefore also be investigated.



**Figure 1.2 Different duty-bearers with regard to children 0–24 months (adapted from Kent’s nested rings of responsibilities)<sup>55,3</sup>**

The management of diarrhoea is guided by the IMCI guidelines that should be used to determine the severity of each case and how to treat it. When a child is not ill enough to be admitted to hospital, the mother should be advised to give extra fluids, to give zinc supplements, to continue feeding, and to bring the child back for a follow-up appointment.<sup>32</sup>

The purpose of this study is therefore to determine if caregivers receive the correct information from other duty-bearers like nursing practitioners and if they apply the information correctly. Because children 0–24 months of age cannot take care of themselves, they need responsible people to take care of them; therefore this study focuses on the extent to which selected duty-bearers fulfil these responsibilities.

## **CHAPTER 2: METHODOLOGY**



## **2.1 INTRODUCTION**

As discussed previously (refer to 1.5) children (0–24 months) cannot care for themselves and therefore need responsible people to care for them. This study therefore investigated the role of selected duty-bearers in fulfilling the right to water for children 0–24 months.

## **2.2 STUDY AIM AND OBJECTIVES**

### **2.2.1 Aim of the study**

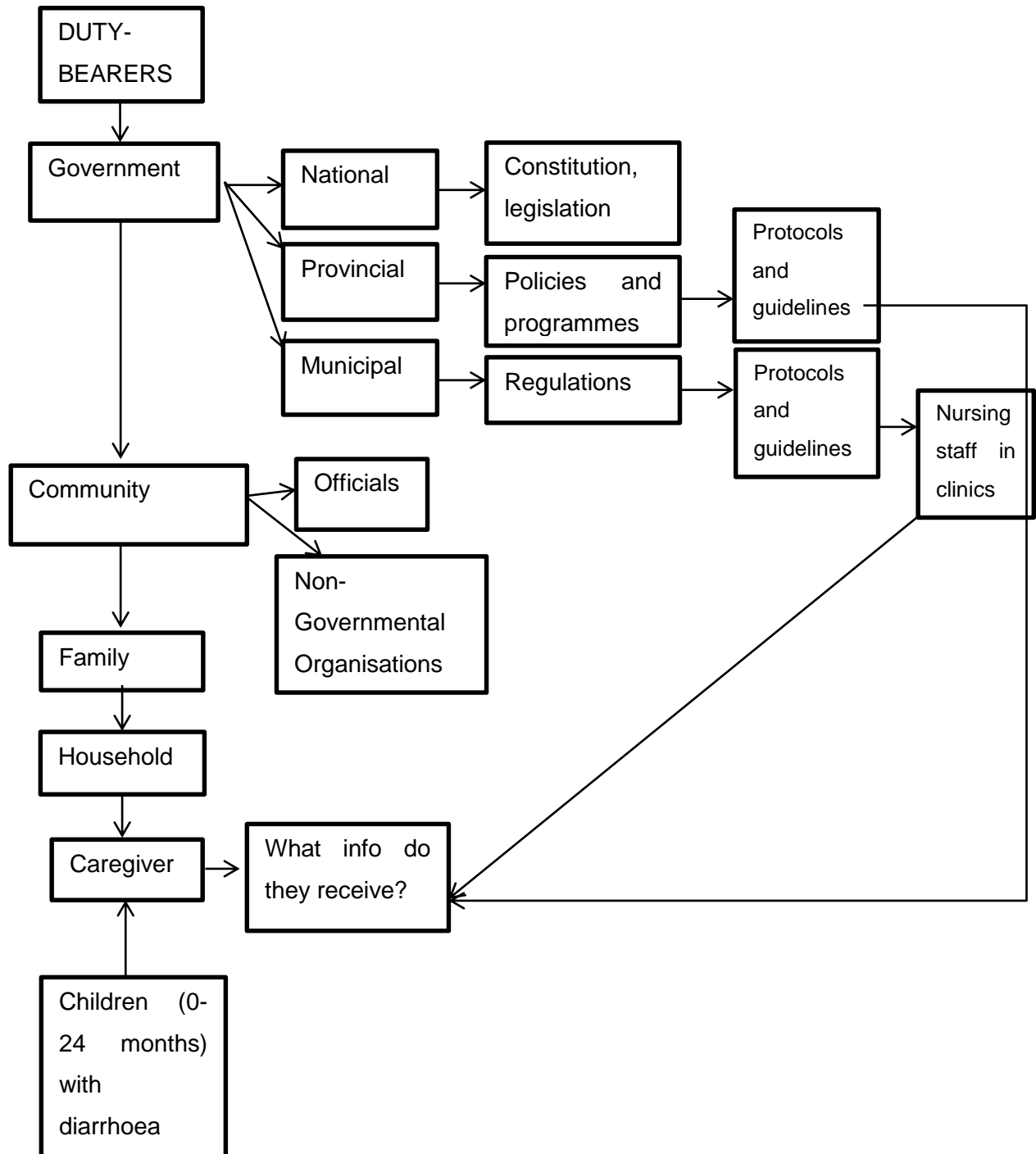
The main aim of this study was to investigate whether selected duty-bearers are fulfilling their responsibilities towards the realisation of the right to water of children (0–24 months) residing in the town of Colesberg during the nutritional management of diarrhoea in primary health care institutions.

### **2.2.2 Research objectives**

1. To investigate if the child's right to safe and adequate water is realised
  - By determining the knowledge and practices of caregivers regarding water for household use
  - By determining the coping strategies of caregivers during periods of water shortages or poor water quality
  - By determining the perceptions of caregivers of barriers to the realisation of the right of their children (0–24 months) to safe drinking water
  - By determining the perceptions of nursing practitioners of the child's right to water and barriers to the realisation of the right to safe drinking water for children (0–24 months)
2. To investigate the prevalence and management of diarrhoea
  - By determining the incidence of diarrhoea in the study population
  - By determining the effect that barriers to the realisation of the right to safe drinking water have on the prevalence of diarrhoea in children 0–24 months.
  - By determining the knowledge and practices of caregivers which could be causative or preventative of diarrhoea
  - By determining the knowledge, attitudes and counselling practices of nursing practitioners in managing the prevalence of diarrhoea.

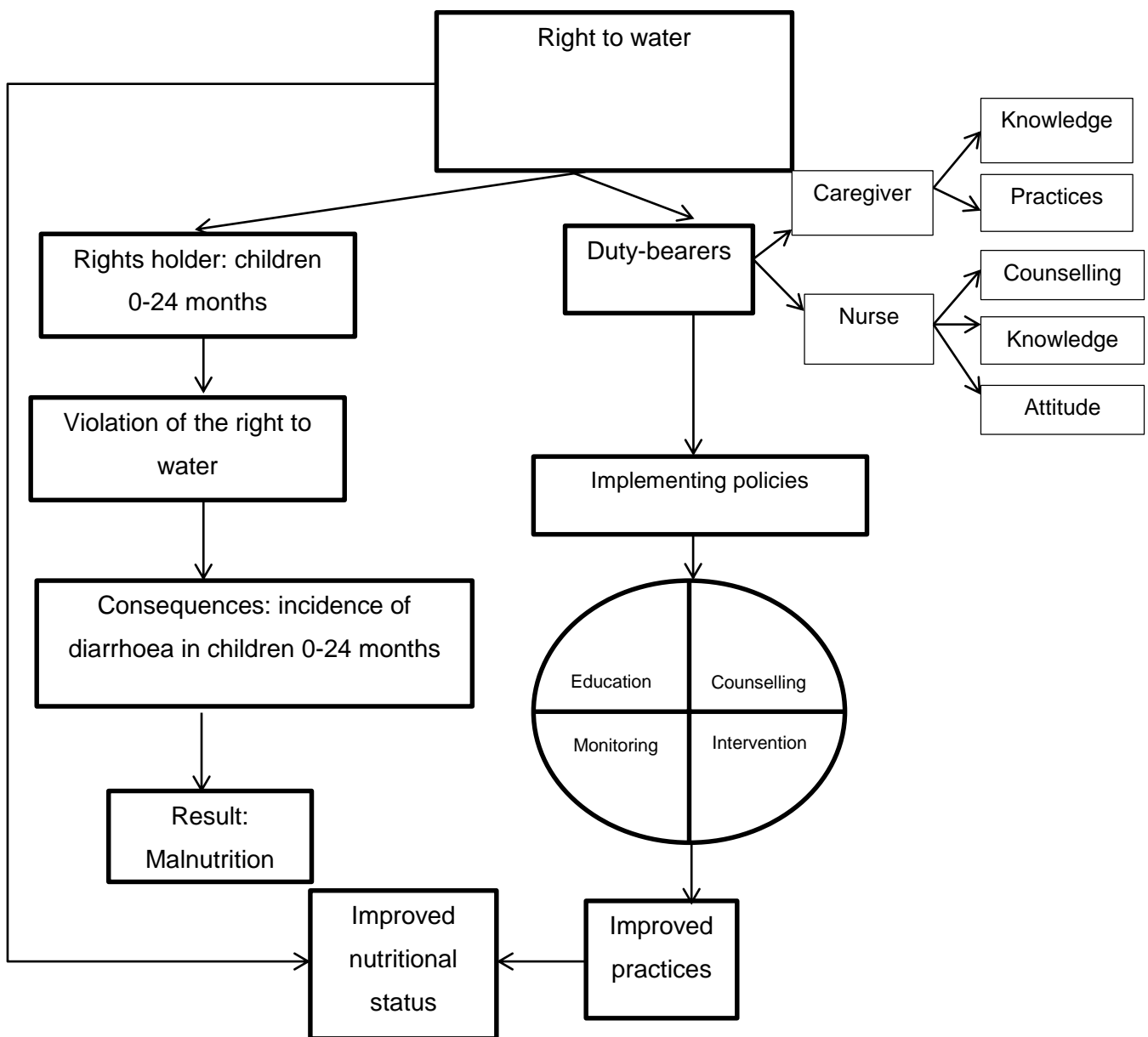
### 2.2.3 Conceptual framework

A conceptual framework was compiled by the researcher to illustrate the interaction between various duty-bearers responsible for the care of children aged 0–24 months with diarrhoea (*Figure 2.1*).



**Figure 2.1: Conceptual framework to illustrate the various duty-bearers responsible for the care of children aged 0–24 months with diarrhoea**

This conceptual framework illustrates the right to water of children 0–24 months of age, the consequences of their right to water not being realised and what can be done to help realise it (Figure 2.2).



**Figure 2.2: Conceptual framework to illustrate the right to water of children aged 0–24 months**

## 2.3 STUDY DESIGN

An observational study, in the form of a cross-sectional survey with an analytical component, was performed.

### 2.3.1 Study design overview

A mixed-method approach was used where quantitative and qualitative data were gathered during the same time frame, but data was collected and analysed separately. The purpose of such a design is “to obtain different but complementary data on the same topic”.<sup>56</sup>

## 2.4 STUDY POPULATION AND SAMPLING

### 2.4.1 Study population

The study population consisted of two groups, namely the caregivers of children aged 0–24 months and nursing practitioners who treat children of that age group. The two groups are discussed separately.

#### 2.4.1.1 Caregivers

This study population consisted of the caregivers of children aged 0–24 months visiting Lowryville Clinic and Kuyasa Clinic in Colesberg and Norvalspont Clinic in Norvalspont, Northern Cape. These three clinics were conveniently/purposively chosen because they are the referral clinics for Manne Dipico Hospital in Colesberg.

#### 2.4.1.2 Nursing practitioners

This study population consisted of the nursing practitioners from Lowryville Clinic, Kuyasa Clinic, Norvalspont Clinic and Manne Dipico Hospital that consult with caregivers of children 0–24 months of age who suffer from diarrhoea.

### 2.4.2 Sample selection

#### 2.4.2.1 Caregivers

Proportional stratified sampling was used to select the participants for the study, which implies that the strata<sup>h</sup> had to be mutually exclusive and collectively exhaustive.<sup>1</sup> The population groups of

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<sup>h</sup> Relevant strata (subgroups) of the population that differ with regard to the measurements made. One would want these strata to be represented adequately in the sample.<sup>1</sup>

each of the clinics differed from each other, but the individuals within the clinic did not differ that much from one another, therefore the three clinics each formed a different stratum.

To select the individuals from each stratum, systematic random sampling was used since there was no comprehensive list with all the names of the children in the relevant population group available. Screening (Appendix A) was done to identify caregivers that complied with the inclusion criteria. Every second caregiver and child in the queue on the days of data collection were approached and screened for participation in the study. The consent forms were then explained to the caregiver and if the caregiver did not give consent to participate in the study the next mother was approached. This process was continued until the appropriate sample size for each clinic was reached.

#### **2.4.2.2 Nursing practitioners**

Purposive sampling was used to select the nursing practitioners. The first two available nursing practitioners that were willing to participate in the study were included.

### **2.4.3 Sample size**

#### **2.4.3.1 Caregivers**

The sample size was determined with the assistance of a statistician from Stellenbosch University. During the time of data collection, there were approximately 630<sup>i</sup> children in the 0–24 month-old population group in Colesberg. The number of children attending the various clinics was as follows: Lowryville Clinic 40% ( $n=250$ ), Kuyasa Clinic 44% ( $n=280$ ) and Norvalspont Clinic 16% ( $n=100$ ).

For a confidence interval of 95% to estimate a proportion within and an error margin of 8%, a study population of 123 caregivers was needed. For it to be proportional stratified sampling, the distribution calculated is shown in Table 2.1.

**Table 2.1: Proportional stratified sampling**

CLINIC	Total number of children at each clinic	Percentage of total children	Sample size
Kuyasa Clinic	280	44	54
Lowryville Clinic	250	40	49
Norvalspont Clinic	100	16	20
<b>TOTAL</b>	<b>630</b>	<b>100</b>	<b>123</b>

<sup>i</sup> Information obtained from District Health Information System. Statistics for birth rates, incidence of diarrhoea and exclusive breastfeeding rate for 2011, 2012. Pixley Ka Seme District, Northern Cape.<sup>52</sup>

### **2.4.3.2 Nursing practitioners**

There were approximately 20 nursing practitioners in the three clinics and in the hospital that usually care for children aged 0–24 months: five each at Lowryville Clinic and Kuyasa Clinic, two at Norvalspont Clinic and ten at Manne Dipico Hospital. Two nursing practitioners were interviewed at each facility, therefore a total of eight nursing practitioners were interviewed.

### **2.4.4 Inclusion criteria**

#### **2.4.4.1 Caregivers**

- These comprised caregivers of children between 0–24 months old visiting the clinic on the day of data collection.
- The caregiver must have had the child's Road to Health Booklet with him/her.
- Caregivers residing in the Umsobomvu District for longer than one year.
- All Afrikaans-, English- and isiXhosa-speaking caregivers.

#### **2.4.4.2 Nursing practitioners**

- All professional nurses, enrolled nurses, enrolled nursing assistant and auxiliary nurses that usually treat children of 0–24 months, who were on duty on the day of data collection.
- Nursing practitioners that were able to speak Afrikaans or English were included.

### **2.4.5 Exclusion criteria**

#### **2.4.5.1 Caregivers**

- Caregivers that did not give written, informed consent to take part in the study.
- Caregivers who brought their ill children to the clinic.
- Caregivers who participated in the pilot study.

#### **2.4.5.2 Nursing practitioners**

- Nursing practitioners that had worked for less than six months at that particular facility.
- Nursing students that were only there temporarily.
- Nursing practitioners that did not given written, informed consent to participate in the study.

## 2.5 METHODS OF DATA COLLECTION

A quantitative research method (a questionnaire with both open and closed ended questions) was used to obtain information from caregivers and qualitative research methods were used to obtain information from nursing practitioners.

### 2.5.1 Questionnaire administration to caregivers

Once approval had been obtained from all the relevant departments and committees (refer to the section on ethics), the Lowryville, Kuyasa and Norvalspont clinics were contacted to inform them of the study and to give them the letter of approval from the Department of Health. Permission was sought from the sister in charge at the respective clinics to conduct the study during the weekly baby clinics.<sup>j</sup>

Data was collected from February to August 2014. A schedule was compiled of the days that data collection would take place at each facility. Where possible, the questionnaires were administered on Mondays at Lowryville Clinic and on Tuesdays at Kuyasa Clinic during the weekly baby clinics. Since Norvalspont Clinic's baby clinic is also on a Monday, a suitable Monday was arranged with them to collect data at their clinic. Other days were used where necessary to reach the required number of participants per clinic.

Each clinic was contacted in advance to confirm the first day of data collection at the facility. The sister in charge was approached and the necessary documentation was provided to her. It was arranged with the sister in charge to use a private consultation room for the duration of the data collection period, for example, the room of the dietitian on the day of the baby clinics.

Since most of the caregivers gather in the waiting room, an announcement was made by the sister in charge to inform them about the study and to ask them to be patient while the questionnaires were completed. The researcher then explained that all patients will be screened to determine if they complied with the inclusion criteria. The researcher also explained that every second caregiver that met the inclusion criteria for participation in the study would be approached. If caregivers met the inclusion criteria, they were asked to take part in the study and informed that participation was voluntary. If a caregiver agreed to participate in the study, written informed consent was then obtained by the researcher or researcher assistant.

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<sup>j</sup> At the weekly baby clinics all the children who came for growth monitoring and immunisations were seen and this made it the ideal opportunity to reach as many children as possible at one given moment.

The caregiver questionnaire was administered by the researcher in English (Appendix C) or Afrikaans, and where necessary, in isiXhosa with the assistance of a trained interpreter.

The researcher/interpreter completed the participant's responses on the questionnaire during the interview. The interpreter used the isiXhosa questionnaires but recorded the answers in English. The interpreter also translated the responses to open questions into English.

After completion of the questionnaire, each questionnaire was checked for completeness by the researcher before the caregiver left the room. The completed questionnaire and consent form were then placed in a sealed container for data analysis.

### **2.5.2 Semi-structured interviews with nursing practitioner**

Once approval was obtained from all the relevant departments and committees (refer to the section on ethics), the managers of the relevant facilities were contacted to obtain permission to approach their staff and to arrange for a suitable venue to conduct the interviews (e.g. the office of the nursing practitioner or the office of the dietitian).

Two nursing practitioners were interviewed at each facility. An appointment date and time was scheduled with the purposively selected participants. The purpose of the study and the importance of their participation were explained. Informed consent was obtained for participation and for the voice recording of the interview (Appendix D). A semi-structured interview schedule was developed by the researcher to ensure consistency during all interviews (Appendix E). The interviews were conducted in either English or Afrikaans and were dependent on the preferred language of the nursing practitioner. The researcher tried to create a safe and relaxing atmosphere while the interview was conducted. After all the required information had been obtained, the nursing practitioner was thanked for participating in the study. The researcher tried to keep the interview as short as possible so that the nursing practitioner was not kept too long from his/her duties. None of the interviews was longer than 15 minutes.

The interviews at the individual clinics were conducted in the office of the nursing practitioner, at a time that was convenient for her and the facility (mostly in the afternoons when the clinics were not as busy). The interviews at the hospital were conducted in the office of the researcher at a time most convenient for the nursing practitioner. The attitudes of the nursing practitioners were mostly open and not hostile and they were able to speak openly about the problems. When they seemed too rushed or irritated, the researcher arranged another time that was more convenient for the nursing practitioner.



Interviews were transcribed by the researcher and the Afrikaans interviews were translated to English for the purpose of the thesis but the original Afrikaans quotes were referenced. Transcripts were reviewed by the researcher to ensure the content was a true reflection of the recorded discourse.

## **2.6 RESEARCH INSTRUMENTS**

Two research instruments were used for data collection. One was the interviewer- administered questionnaire for the caregivers and the other one was the discussion guide for the semi-structured interviews with nursing practitioners.

### **2.6.1 Questionnaire development**

A structured interviewer-administered questionnaire was used to collect data from the caregivers of children aged 0–24 months. The questionnaire was developed by the researcher based on the research objectives of the study, current literature and the IMCI guidelines for the handling of diarrhoea. It was adapted after the pilot study and the input from one expert in the field of childhood nutrition, one expert in the field of human rights and another expert in the field of IMCI. The questionnaire was available in English, Afrikaans and isiXhosa (Appendix B).

The consent forms and questionnaires were translated into isiXhosa and back into English for quality assurance and accuracy, before data collection. The questionnaire was used to collect data on the practices and knowledge of caregivers regarding the management of diarrhoea, infant feeding practices, and the treatment and storage of drinking water and water for household use, personal hygiene and household sanitation. The perceptions of caregivers of children aged 0–24 months of barriers to the realisation of the right to safe drinking water was also determined. The questionnaire for caregivers consisted of four sections (*Table 2.2*).

**Table 2.2: Questionnaire summary**

Section number	Subject	Number of questions		Theme
		Open-ended	Closed	
One	Demographic information	2	6	General information on demographics
Two	General household information	13	11	Household resources Attitudes and knowledge towards the water situation
Three	Nutritional information	10	13	Nutritional habits Preparation of formula milk
Four	Child morbidity	6	8	Knowledge of when child has diarrhoea and how to treat it.

### 2.6.2 Discussion guide for nursing practitioners

Semi-structured interviews were conducted with the nursing practitioners and an interview schedule was compiled for this purpose (Appendix E).

The discussion topics covered four broad themes:

- An introduction that set them at ease and aided in giving the researcher a general idea of how much relevant experience the nursing practitioners had.
- The role of water in healthy nutrition. This included questions on the role of water in a child's nutrition, whether the quality of water in this community had an effect on the nutrition of these children and practical ways of coping during periods of water shortages.
- Water as a human right and the duty-bearers responsible to realise this right. This included questions about human rights in general; if water is a human right; whose responsibility it is to provide enough, safe water to the community; if this responsible party is fulfilling its responsibility and what the community can do to ensure adequate safe water for consumption.
- The role water plays with regard to the prevalence of diarrhoea. This included questions on whether they think that the water in the community can cause diarrhoea; if they ever noticed a change in health of children when there was a change in water quality; if there are guidelines available to follow when a child has diarrhoea; what information is given to a caregiver of a child with diarrhoea; their opinion about the consumption of food and liquids during a bout of diarrhoea and any additional thoughts about the matter.

## 2.7 QUALITY ASSURANCE

### 2.7.1 Standardisation of research assistant and interpreters

The researcher trained one interpreter to assist during the data collection process and to assist the researcher in completing questionnaires when the participants' first language was isiXhosa. The interpreter was fluent in isiXhosa and English or Afrikaans, have at least a matric qualification and be available weekday mornings between 08:00 and 13:00. She was trained in completing the questionnaire correctly and recording each answer accordingly. The process of obtaining informed consent was also explained to her in detail.

Due to circumstances, four interpreters were trained and utilised during the course of the data collection period, owing to problems related to the reliability, bilingualism and availability of the interpreters.

The researcher also trained one research assistant to assist with the Afrikaans and English questionnaires. The research assistant was fluent in Afrikaans and English and had a matric qualification. She was instructed in completing the questionnaire correctly and recording each answer accordingly. The process of obtaining informed consent was also explained to her in detail.

### 2.7.2 Pilot study

#### 2.7.2.1 Face validity

**Face validity** refers to the extent to which the measure or question makes sense to those knowledgeable about the subject or to interviewers familiar with the language and culture of participants.<sup>1</sup>

To improve the face validity and reliability of the tools used in the main study, a pilot study was conducted during January and February 2014 by the researcher and the interpreter at Eureka Clinic and Simon Zono Clinic in Noupoot. These two clinics were chosen because they were similar to the clinics selected for data collection for the main study.

In qualitative studies the instrument of data collection and interpretation is the researcher. A possible shortcoming is therefore the likelihood of subjectivity and bias, which has to be dealt with.<sup>1</sup> The researcher herself is a registered dietitian who works in Colesberg and has a background in community nutrition. Her office is at the hospital but her duties include servicing the clinics, some of which were included in this study. She works closely with the community in the local clinics and has a special interest in the rights and needs of children.

The comprehensive records kept of the data collected and the data analysis procedure were an additional measure for ensuring reliability. All these measures assisted in addressing possible researcher bias and subjectivity.

Simon Zono Clinic is mostly visited by isiXhosa-speaking patients and was deemed a suitable location for the standardisation of the interpreter as well as to test the isiXhosa questionnaire. The ten participants in the pilot study were selected by using convenience sampling from among the caregivers that attended the weekly baby clinic. The first caregivers that had arrived and had given written informed consent were used for the pilot study. The same procedure as for the main study was followed to complete the questionnaire. The questionnaire was tested for face validity as well as to evaluate if the caregivers had understood the questions correctly.

The questionnaire for caregivers was also completed by one nursing practitioner to assess the face validity. The nursing practitioner was asked to complete a form with comments on the layout and font of the questionnaire, the clarity of the questions, and whether the language was clear. Further suggestions to enhance the clarity of the questions were also solicited. The relevant comments were taken into consideration and the questionnaire was adapted accordingly. More questions on certain demographic aspects were included. Some of the questions were just rephrased to clarify them. Some of the open-ended questions were changed into closed-ended questions to make them easier to answer and analyse.

An interview was conducted with one of the nursing practitioners at one of the pilot sites to assess the discussion guide as well as to determine the time required to complete the interview. Necessary changes were made to the discussion guide according to the input of the nursing practitioner. It was determined that the interviews would take no longer than 20 minutes.

#### **2.7.2.2 Content validity**

**Content validity** requires that the measure accounts for all the elements of the variable or concept being investigated.<sup>1</sup>

To evaluate the content validity of the questionnaire and the discussion guide, it was assessed by two experts in the field of Infant and Young Child Feeding (IYCF): one was an IYCF qualified nursing practitioner and the other one was a dietitian with experience in IYCF. Both the questionnaire and discussion guide were assessed by an expert in human rights and nutrition as well. Changes were made to the questionnaire and discussion guide according to the comments received. No changes were needed with regard to the human rights aspects. The dietitian

suggested that more questions on feeding practices should be added because feeding practices impact on prevalence of diarrhoea. She also suggested some changes in wording to make it easier to answer. The changes to the discussion guide mostly centred on rephrasing some of the questions to make them easier to answer.

## **2.8 DATA ANALYSIS**

### **2.8.1 Quantitative data analysis of questionnaire for caregivers**

MS Excel was used to capture the data and STATISTICA version 11 (StatSoft Inc. (2012) STATISTICA (data analysis software system), [www.statsoft.com](http://www.statsoft.com).) was used to analyse the data. A statistician appointed by the Faculty of Medicine and Health Sciences, Stellenbosch University, analysed the quantitative data.

Summary statistics were used to describe the variables. Distributions of variables were presented with histograms and/or frequency tables. Medians or means were used as the measures of central location for ordinal and continuous responses, and standard deviations and quartiles as indicators of spread.

Relationships between two continuous variables were analysed with regression analysis and the strength of the relationship was measured with the Pearson correlation or Spearman correlation when the continuous variables were not normally distributed. When one continuous response variable was related to several other continuous input variables, multiple regression analysis was used and the strength of the relationship was measured with multiple correlations.

The relationships between continuous response variables and nominal input variables (like different diets) were analysed using appropriate analysis of variance (ANOVA). When ordinal response variables were compared versus nominal input variables, non-parametric ANOVA methods were used. For completely randomised designs, the Mann–Whitney test was used.

The relation between nominal variables was investigated with contingency tables and appropriate chi-square tests like the maximum likelihood ratio chi-square test.

A  $p$ -value of  $p < 0.05$  represented statistical significance in hypothesis testing and 95% confidence intervals were used to describe the estimation of unknown parameters.

## **2.8.2 Qualitative data analysis**

This study had two sets of qualitative data, namely data from open-ended questions and data from semi-structured interviews.

### **2.8.2.1 Qualitative analysis of open-ended questions**

Each section of the questionnaire contained open-ended questions (*Table 2.2*). Caregivers' responses to these questions were deductively grouped into categories; thereafter the researcher used the categories as they appeared from the data. The results of the open-ended questions were tabulated in an MS Excel spread sheet.

### **2.8.2.2 Qualitative analysis of semi-structured interviews**

To analyse qualitative data it is necessary to transcribe the data, become familiar with the data by reading it numerous times, code the data with relevant codes, identify themes and categories, interpret the data, extrapolate findings, and reach conclusions.<sup>1</sup> The audio recordings were transcribed and the data was explored in detail for common themes and sub-themes and these were then collated into units of meaning.<sup>1</sup> Content analysis was used. Data was checked and rechecked until no new information or themes emerged.

## **2.9 ETHICS AND LEGAL ASPECTS**

### **2.9.1 Ethics approval**

Ethics approval to perform the study was obtained from the Health Research Ethics Committee, Faculty of Medicine and Health Sciences, Stellenbosch University (Ethics reference number S13/05/108, Appendix F).

### **2.9.2 Authorisation**

Once ethics approval had been obtained, approval was sought from the Department of Health of the Northern Cape. The relevant documents (Appendix G and protocol) were sent to the District Manager of Pixley Ka Seme District, who then forwarded them to the Ethics Committee at the Provincial Office of the Department of Health in the Northern Cape.

Permission to conduct the research at the relevant health facilities was obtained from:

1. District Co-ordinator for Nursing at the District Office of the Pixley Ka Seme District
2. Sisters in charge at Lowryville Clinic, Kuyasa Clinic and Norvalspont Clinic
3. Hospital Manager of Manne Dipico Hospital

### **2.9.3 Informed consent**

Each caregiver and nursing practitioner was asked to complete a written informed consent form (Appendix B, D). Each participant received a signed copy of the completed consent form. The consent form explained that there would be no risks involved and that the questionnaires would be anonymous. Each participant was assigned a number for use during data capturing and analysis only. Only the researcher would handle the original data to maintain confidentiality. Participation was voluntary and caregivers and nursing practitioners could withdraw from participation during any part of the data collection process, although none of them did so.

Additionally, nursing practitioners provided consent separately for the voice recording of interviews.

### **2.9.4 Participant confidentiality**

Questionnaire information was treated as confidential and all questionnaires were anonymous by assigning a number to each participant. Voice recordings and transcribed data were password protected, and will be destroyed within six months after completion of the research. Nursing practitioners were not identified during the reporting of data.

To maintain confidentiality, only the researcher handled the original data. The results of the study will be published but no names or facilities will be made public.

### **2.9.5 Benefits of participation**

It was expected that findings from this study would reveal valuable information in respect of the role of duty-bearers with regard to the right to water during the nutritional management of children with diarrhoea. Future patients may benefit from this research as it may lead to an improvement in the type of information provided to caregivers to prevent and treat diarrhoea in children during water shortages and in times of poor water quality. Possible benefits will be communicated to the Northern Cape Department of Health as well as to dietitians.

## **CHAPTER 3: RESULTS**



### 3.1 INTRODUCTION

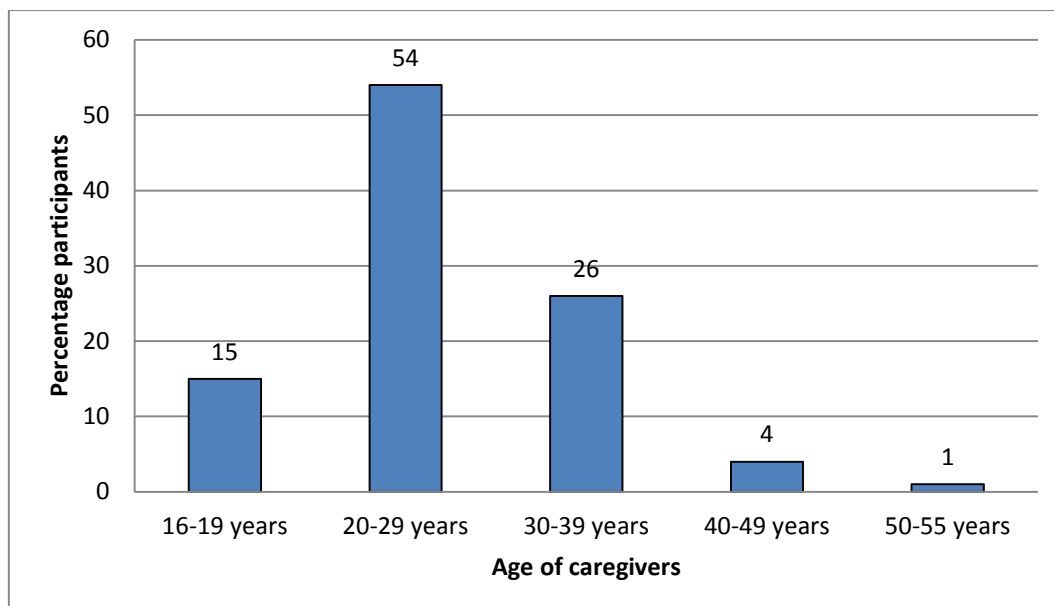
This chapter follows a systematic approach to present the results from 123 interviewer-administered questionnaires to caregivers. The questions were analysed according to the number of caregivers that answered a particular question; thus the total number of participants vary. The caregivers' questionnaire consisted of both closed- and open-ended questions; therefore quantitative and qualitative results of the questionnaires are reported and presented in accordance with the objectives of this study. Furthermore, eight semi-structured interviews conducted with nursing practitioners are reported in an attempt to gain a better understanding of the realisation of the right to water of children aged 0–24 months, living in Colesberg.

### 3.2 BACKGROUND INFORMATION

#### 3.2.1 Socio-demographic information of caregivers and their children aged 0–24 months

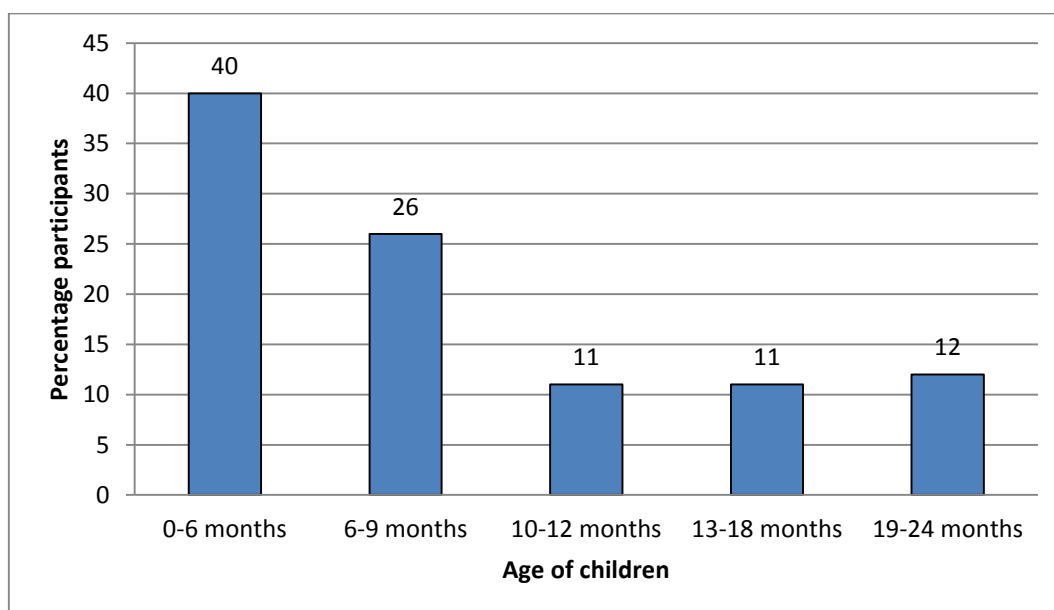
In total, 123 caregivers participated in the study: 44% ( $n=54$ ) attended Kuyasa Clinic, 40% ( $n=49$ ) Lowryville Clinic and 16% ( $n=20$ ) Norvalspont Clinic. The majority of the caregivers (93%,  $n=114$ ) lived in town, 4% ( $n=5$ ) lived in informal settlements, while 3% ( $n=4$ ) lived on farms.

Ninety-two percent ( $n=116$ ) of caregivers were the children's biological mothers, while only 3% ( $n=4$ ) were the children's foster parents and two percent ( $n=3$ ) were the children's caregivers for more than three days per week. The age of the caregivers ranged between 16–55 years, with the majority (54%,  $n=67$ ) of caregivers between 20 and 29 years. The mean age of caregivers was 27 years ( $SD\pm7.5$ ) (*Figure 3.1*).



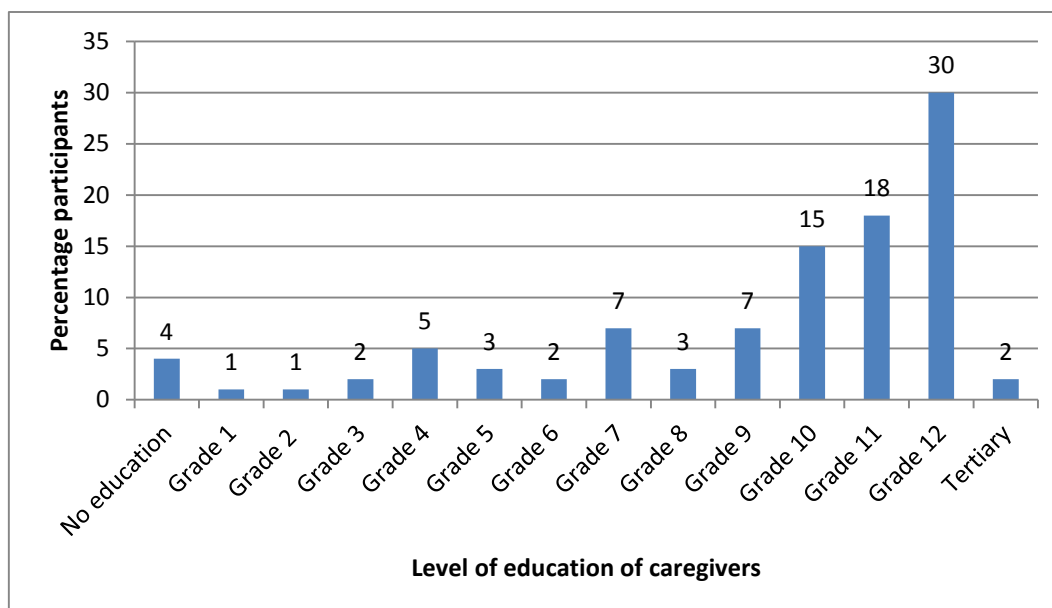
**Figure 3.1: Age of caregivers of children aged 0–24 months, according to different age groups ( $n=123$ )**

As per the inclusion criteria, all children were between 0–24 months of age. The majority of children (65%,  $n=80$ ) were in the 0–9-month category (*Figure 3.2*), with a mean age of nine months ( $SD\pm6.6$ ).



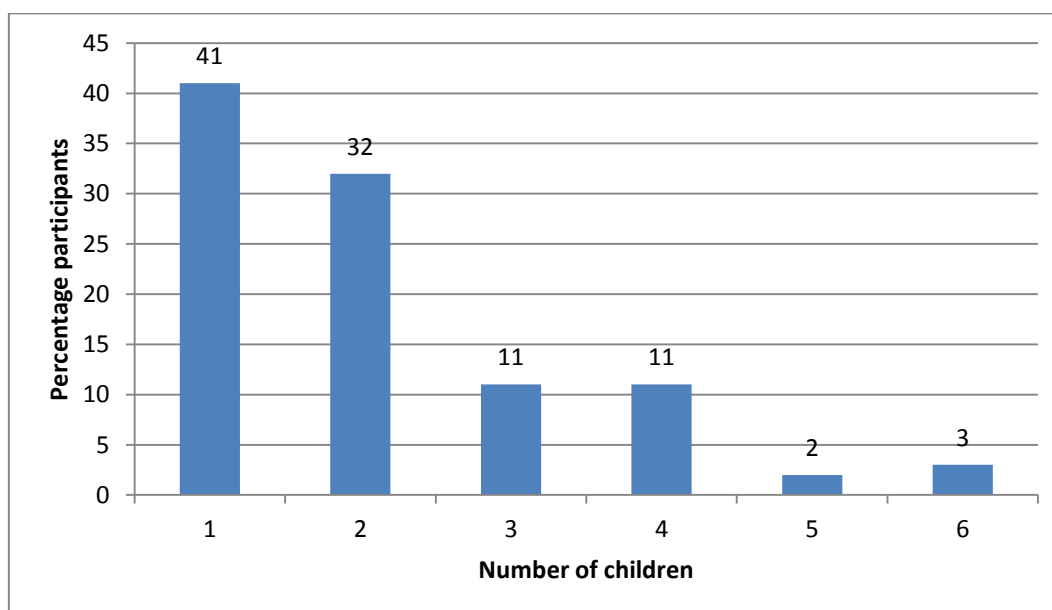
**Figure 3.2: Age of children according to different age groups ( $n=123$ )**

The education level of the caregivers ranged from no education (4%,  $n=5$ ) to a tertiary education (2%,  $n=3$ ). Of the 123 caregivers, 21% had only primary education, while 7% of the total number of caregivers ( $n=8$ ) had completed primary school. The majority of caregivers (76%,  $n=93$ ) had a secondary education of which 30% ( $n=38$ ) of the total number of caregivers had completed Grade 12 (*Figure 3.3*).



**Figure 3.3: Percentage of caregivers of children aged 0–24 months, according to their level of education ( $n=123$ )**

The mean number of children per caregiver was two ( $SD \pm 1.25$ ). Almost three-quarters of caregivers (73.2%,  $n=90$ ) either had one or two children (*Figure 3.4*).



**Figure 3.4: Number of children per caregiver ( $n=123$ )**

The majority of caregivers (87%,  $n=107$ ) were unemployed at the time of data collection; however, 86% ( $n=106$ ) indicated that they received a regular income, with a median income of R620.00<sup>k</sup> per household per month. The minimum income per household per month was R310.00 and the

<sup>k</sup> Rand-dollar exchange rate: ZAR13.86. Constitutes an income of US\$1.49 (R20.66) per day.

maximum income per household per month was R10000.00. Of the 106 caregivers that received a regular income, 84% ( $n=89$ ) were dependent on child support grants paid by the South African Social Security Agency (SASSA).

In summary, caregivers of children 0–24 months were mainly young mothers with secondary school education, yet the majority were unemployed and were dependent on the child support grant for financial support. The majority of children were younger than 9 months.

### **3.2.2 Socio-demographic information of nursing practitioners**

The nursing practitioners who participated in the study were employed at Kuyasa Clinic and Lowryville Clinic in Colesberg, Norvalspont Clinic, and Manne Dipico Hospital in Colesberg. Six of the nursing practitioners were professional nurses (sisters) and two were enrolled nursing assistants. All the nursing practitioners were female. Six of the eight nursing practitioners were Afrikaans speaking and two nursing practitioners were isiXhosa speaking. The interviews with the isiXhosa-speaking nursing practitioners were conducted in English since they had done their training in English and were quite fluent in English.

## **3.3 INVESTIGATION OF THE REALISATION OF THE CHILD'S RIGHT TO SAFE AND ADEQUATE WATER**

Objectives to investigate the utilisation of water in households as well as caregivers' coping strategies during periods of water shortages are reported in this section. Furthermore, the right of the child to clean and safe water was investigated by reporting possible barriers to the realisation of such a right as identified by caregivers and nursing practitioners.

### **3.3.1 The knowledge of caregivers regarding water for household use**

One of the objectives was to determine the knowledge and practices of caregivers regarding water for household use. The caregiver questionnaire mostly collected quantitative data but some questions were followed by open-ended questions to allow participants to voice their opinions spontaneously. These answers are regarded as qualitative data and reported accordingly.

To the question whether they thought the tap water was safe for human consumption, 58% ( $n=71$ ) of the caregivers answered *no*, 38% ( $n=47$ ) answered *yes* and 4% ( $n=5$ ) of the caregivers *did not know* whether the water was safe or not. In response to the question why they thought the water from the taps was not safe, caregivers explained that the water was 'dirty and brown', sometimes

they could see the 'dirt and mud in the water' and sometimes 'the water had an unpleasant smell'. Some caregivers remarked that the water could 'make their stomachs upset' and this could lead to illnesses like diarrhoea or "gastro".

Only 38% ( $n=47$ ) of the caregivers could recall that they had ever received advice on how to treat water to make it safe.

### **3.3.2 Coping strategies of caregivers during periods of water shortages or poor water quality**

Children (0–24 months) are not able to realise their own right to water and therefore it is the responsibility of their parents to provide safe and adequate water. Therefore caregivers need coping strategies to ensure that they will be able to realise the right to water of their children during periods of water shortages or when the quality of water is sub-optimal.

To the open-ended question how they treated water when they thought it was not safe for human consumption, the caregivers responded that they either boiled the water before use, while some let it stand for a while so that the 'dirt can go down' or they put a few drops of chlorine (bleach) in the water to make it safer.

The majority of the caregivers boiled the water before use: 47% ( $n=58$ ) always boiled the water and 46% ( $n=56$ ) boiled the water sometimes. Only 7% ( $n=9$ ) of caregivers never boiled the water before using it.

The majority of the caregivers (86%,  $n=106$ ) stored water at some stage. Most of them stored it in covered containers (68%,  $n=72$ ), but one-third of the caregivers stored it in uncovered buckets (32%,  $n=34$ ).

### **3.3.3 Perceptions of caregivers regarding the barriers to the realisation of the right of their children (0–24 months) to safe drinking water**

Even though caregivers tried to fulfil their parental responsibilities towards their children, there were often barriers that prevented them from fully realising the right to water for their children. The aim of this objective was therefore to identify the barriers that caregivers encountered while trying to realise their children's right to water. The availability of household facilities that impacted on the accessibility and quality of water to households was investigated.

Water sources:

Fifty percent ( $n=61$ ) of the caregivers ( $n=123$ ) had a tap inside their homes, 48% ( $n=59$ ) had taps outside their houses but still in their yards, and 2% ( $n=3$ ) of the caregivers had to fetch their water for household use from a public tap.

Electricity and equipment available to store water and food safely:

Of the 123 caregivers, 89% ( $n=110$ ) had electricity available in their household. Of those that had electricity, 74% ( $n=91$ ) had a refrigerator.

Cooking medium to enable caregivers to boil water:

Eighty-seven percent ( $n=107$ ) of the caregivers used electrical appliances to boil water, 8% ( $n=10$ ) used paraffin, 1% ( $n=1$ ) used gas and 4% ( $n=5$ ) used an open fire outside. Eighty-seven percent ( $n=107$ ) had a stove, 81% ( $n=100$ ) had an electric kettle and 57% ( $n=70$ ) had a microwave oven.

All the caregivers were of the opinion that it was their own as well as their children's basic human right to have access to water and explained that no human being can 'survive without water'. When asked how they felt when there was no water available, the caregivers felt that it 'affects their child because they [the caregivers] cannot care for them'. They were also 'not able to prepare food' and if they did not store water there was 'nothing to drink'. Caregivers expressed a range of emotions such as anger and 'feeling powerless' because they were unable to do anything about the water situation. Most caregivers realise that they must also do their part by paying their water and electricity bills to prevent the municipality from terminating these services.

### **3.3.4 Perceptions of nursing practitioners of the child's right to water and barriers to the realisation of the right to safe drinking water for children (0–24 months)**

Semi-structured interviews were conducted with eight nursing practitioners from the relevant facilities to provide the researcher with a deeper understanding of the barriers duty-bearers may encounter in the realisation of the right to safe drinking water for children (0–24 months).

Nursing practitioners' perception of human rights varied but they felt that the right to water was one of the most important human rights and a person could not survive if water were not provided. The following quote explains:

“Water is one of the most important human rights that must be provided. And if I think of our community and our children and especially with the numbers of malnutrition and gastroenteritis and food poisoning and those types of illnesses that we have, then I would basically say that we must have water because it is a person’s right to have water, safe water, available water. (Nursing practitioner) (Translated from original Afrikaans transcript)<sup>1</sup>”

They were of the opinion that people have too many rights and that caregivers do not always accept their responsibilities to deserve such rights. It is especially important when children are involved because they are not able to provide for themselves.

When asked about their perceptions of the role of water with regard to children’s feeding and their nutritional status, the nursing practitioners felt that safe water was one of the most important factors in the feeding of children in preparing their food and keeping them hydrated. ‘If there is no safe water to use, children can die.’

Nursing practitioners identified three barriers to the realisation of the child’s right to water. The main barrier in providing safe drinking water was the intermittent water supply. This was especially true for children who lived in informal settlements where there were not always taps available in the house or yard. According to the nursing practitioners it was almost always necessary to store water to make provision for possible water shortages. This could result in water not adequately stored or storing water for too long. One of the nursing practitioners was of the opinion that this was not really a problem because even if the water was cut off in one area, there were always other areas that still had water. ‘It is therefore a matter of perception, since other people will still see it as a barrier because the water is not available in their homes.’

Nursing practitioners felt that community members were despondent in approaching the municipality to solve problems with water shortages.

“The people of the community are scared to report the water shortages to the officials and on the other hand they feel that even if they report it, nothing will be done.”

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<sup>1</sup> “Water is een van die noodsaaklikes wat moet verskaf word. En as ek nou dink aan ons gemeenskap en onse kinders en veral met die getalle van die wanvoeding en die gastro-enteritis en voedselvergiftigings, daai tipe siektes en goedjies wat voorkom dan sal ek basies sê dan moet ons water hê, want dit is 'n persoon se reg om water te hê, veilige water, beskikbare water.” – Original quote in Afrikaans by nursing practitioner.

The turnaround time to responding to complaints is problematic and need more attention, as illustrated by the following quote:

“They do report the problems, but sometimes the municipality takes very long to respond to complaints. Then the one that had reported the problem must go back a few times to report it again. I really think they can do more. They can respond faster to complaints, because sometimes if a pipe bursts at night, they shut off the water supply to the town and will only repair the pipe the next day. And because it happens unexpectedly, the people of the community are not prepared for the water outage and the community will be without water for more than 12 hours at a time. (Nursing practitioner) (Translated from original Afrikaans transcript)<sup>m</sup>”

The second barrier to realising the right to water of the child was the fact that water was not always safe. Colesberg has periodic outbreaks of gastroenteritis when it is suspected that the water is microbiologically unsafe; however this could not be proved. According to one of the nursing practitioners, the caregivers were taught to always boil water, especially for drinking purposes. One of the nursing practitioners gave the following response to the question if the quality of the water has an impact on the nutritional status of children in this community:

“I think so, because one can sometimes see that there is a problem with the water because if you store water in a bucket and the water stands for a while then you see the sediment at the bottom of the bucket. That is why we rather use bottled water. We always boil the water or we buy water just to be on the safe side. Earlier we had seen more gastro during the summer months and the hospital would never have been without one or two gastro cases during that time but now we see gastro throughout the year. (Nursing practitioner) (Translated from original Afrikaans transcript)<sup>n</sup>”

Thirdly, nursing practitioners regarded the caregivers themselves as another barrier to realising the right to water of children 0–24 months. The nursing practitioners felt that most parents take good care of their children but there were incidents when children who were brought to the clinic were

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<sup>m</sup> “Hulle meld dit aan, maar soms sloer die munisipaliteit om te reageer op daai klagtes. Dan moet die een wat die klag indien ‘n hele paar keer teruggaan. Ek dink hulle kan meer doen. Hulle kan vinniger reageer op die klagtes, want partykeer as ‘n pyp vanaand bars dan sit hulle die watertoevoer van die dorp af en word die pyp eers die volgende dag reggemaak. En omdat dit skielik is, is die mense dan nie voorbereid daarop nie en is die mense maklik vir 12 ure plus sonder water.” – Original quote in Afrikaans by nursing practitioner.

<sup>n</sup> “Ek dink so want mens kan sien met die probleem wat ons het met die water, as ‘n mens die water in die emmer geskep het en die water staan dan sien mens die afsaksels onder. Dit is hoekom ons eerder die gedistilleerde water gebruik. Ons kook maar die water of ons koop maar water om aan die veilige kant te wees. Ons het altyd hier in die somermaande meer gastro gesien, hier in November, Desember, Januarie maand dan is daar swaar gastro's wat inkom en uitgaan; inkom en uitgaan. Die hospitaal is nooit sonder gastro's in daai tyd nie. Maar nou kan mens sien, sommer deur die jaar is daar gastro's.” – Original quote in Afrikaans by nursing practitioner.



dirty, ill and dehydrated. As children cannot provide for themselves, it is the parent's duty to help children to realise their right to water but " ... most of these parents don't care ... " The nursing practitioners teach mothers to use the health promotion messages (especially the recipe for the ORT) in the Road to Health Booklets; however, caregivers still arrive with dehydrated children."

### **3.4 THE PREVALENCE AND MANAGEMENT OF DIARRHOEA**

For the purpose of this section all objectives related to diarrhoea and the management thereof were reported.

#### **3.4.1 General information about morbidity of children (0–24 months) included in the study population**

Because this study also investigated the role of duty-bearers during the nutritional management of diarrhoea, it was important to obtain some background information about child morbidity in this study population of children aged 0–24 months as well as the main reasons for their attending the clinic.

In response to the question, "What is the main reason for taking your child to the clinic?" more than one option could have been chosen. It was a general question and not specific to the day of data collection. Eighty-one percent ( $n=99$ ) of caregivers indicated that they brought their children to the clinic to be weighed, 100% ( $n=123$ ) of children are brought for immunisations and 82% ( $n=101$ ) of the children were brought to the clinic because they were ill. Only one child (0.8%) did not receive all his/her rotavirus immunisations. None of the caregivers reported that their children had any chronic illnesses.

Fifty-seven percent ( $n=70$ ) of the 123 children had experienced illness in the last four weeks prior to completion of the questionnaire. More specifically, 32% ( $n=39$ ) of the children had more than four watery stools in the past 24 hours, 7% ( $n=9$ ) had presented with a fever, 3% ( $n=4$ ) had a respiratory infection, and 1% ( $n=1$ ) had a poor appetite in the previous four weeks.

#### **3.4.2 Diarrhoea in children (0–24 months)**

##### ***3.4.2.1 Prevalence of diarrhoea in children 0–24 months as reported by caregivers***

The following question was asked: "How often does this child have diarrhoea/loose or watery stools?" The prevalence of diarrhoea was grouped into four categories, namely *never*, *monthly*,

*fortnightly* and *weekly*. Caregivers reported that 69% ( $n=72$ ) of the children had never had diarrhoea previously, while 31% ( $n=32$ ) had diarrhoea frequently.

The group of children ( $n=72$ ) that had never had diarrhoea previously had a mean age of 7 months and the group ( $n=51$ ) that had had diarrhoea previously had a mean age of 12 months. These differ significantly when using an ANOVA  $F$ -test (similar to a pooled  $t$ -test), with  $F=16.729$ . This result was confirmed with a non-parametric Mann–Whitney  $U$ -test. Both tests give a  $p$ -value of  $p<0.01$ . This result shows that the age of the children has a significant effect on whether or not they had diarrhoea previously.

Seventy-five percent ( $n=54$ ) of the caregivers ( $n=72$ ) whose children never had diarrhoea previously had a secondary education, of which 65% ( $n=47$ ) had Grade 10 or higher (Table 3.1). There is no significant difference ( $p=0.54$ ) between the education level of the caregivers and the prevalence of diarrhoea in their children (Table 3.1).

**Table 3.1: The education level of caregivers ( $n=104$ )<sup>o</sup> of children (0–24 months) and the prevalence of diarrhoea**

		What is your highest level of education?										P
		N	%	No education (n)	%	Primary education (n)	%	Secondary education (n)	%	Tertiary education (n)	%	
How often does this child have diarrhoea?	Never	72	69	3	4	14	20	54	75	1	1	0.54
	Monthly	6	6	0	0	4	67	2	33	0	0	
	Fortnightly	20	19	1	5	4	20	15	75	0	0	
	Weekly	6	6	0	0	0	0	6	100	0	0	

ML Chi-Square statistics <sup>#</sup> significant difference,  $p<0.05$

### 3.4.2.2 The management of diarrhoea in children (0–24 months)

According to 58% ( $n=71$ ) of the caregivers, children should continue to consume food while they suffer from diarrhoea. Fifty-seven percent ( $n=70$ ) of the caregivers answered *no* to the question whether or not a child should drink milk while having diarrhoea. The majority (78%,  $n=96$ ) of caregivers answered correctly that children should drink water while having diarrhoea (Table 3.2).

<sup>o</sup> Even though 123 caregivers completed the questionnaires, only 104 caregivers answered the question, “How often does this child have diarrhoea?”

**Table 3.2: Summary of caregivers (n=123) responses to questions with regard to the management of diarrhoea in children (0–24 months)**

	N	Yes (n)	%	No (n)	%	Don't know (n)	%
Should a child receive food if he/she has diarrhoea?	123	71	58	37	30	15	12
Should a child receive milk if he/she has diarrhoea?	123	33	27	70	57	20	16
May your child drink water when he/she has diarrhoea?	123	96	78	11	9	16	13

Children with diarrhoea can easily get dehydrated and it is therefore necessary to prevent and treat dehydration during an episode of gastroenteritis. Oral Rehydration Therapy<sup>p</sup> is an easy, cost-effective recipe that caregivers can prepare at home when children suffer from diarrhoea.<sup>33</sup> In response to the question if the caregivers know what the oral rehydration solution is, 78% (n=96) answered yes. The answer to this question was then compared with the education level of the caregivers (Table 3.3). Of the 96 caregivers who reportedly knew what ORT was, 70 (73%) had a secondary education. There was no significant difference between the caregivers' knowledge of ORT and their education level ( $p=0.43$ ). Upon further analysis, it was found that 55 (61%) of those that had a secondary education (n=90) were able to explain how to mix ORT correctly (Table 3.3). No significant difference between the level of education of caregivers and whether or not they were able to explain ORT correctly ( $p=0.69$ ) was found.

<sup>p</sup> Oral rehydration therapy recipe: 1 litre cooled, boiled water; 8 teaspoons sugar; half teaspoon salt.<sup>33</sup>

**Table 3.3: The knowledge of caregivers of children (0–24 months) of oral rehydration solution and their education level (n=123)**

		What is your highest level of education?										P
		N	%	No education (n)	%	Primary education (n)	%	Secondary education (n)	%	Tertiary education (n)	%	
Do you know what ORT is?	Yes	96	78	5	5	19	20	70	73	2	2	0.43
	No	27	22	0	0	6	22	20	74	1	4	
Were they able to explain ORT?	Correct	72	59	3	4	13	18	55	76	1	1	0.69
	Incorrect	51	41	2	4	12	23	35	69	2	4	

ML Chi-Square statistics # significant difference,  $p < 0.05$ 

Twenty-eight (37%) of those caregivers (n=77) whose children had diarrhoea previously, knew what ORT was (*Table 3.4*). There was no significant difference between the prevalence of diarrhoea and whether they knew what ORT was ( $p=0.22$ ).

**Table 3.4: The knowledge of caregivers of children (0–24 months) with regard to oral rehydration solution and the prevalence of diarrhoea (n=104)**

		Do you know what ORT is?						P
		N	%	Yes (n)	%	No (n)	%	
How often does this child have diarrhoea/ loose or watery stools?	Never	72	69	49	68	23	32	0.22
	Monthly	6	6	5	83	1	17	
	Fortnightly	20	19	18	90	2	10	
	Weekly	6	6	5	83	1	17	

ML Chi-Square statistics # significant difference,  $p < 0.05$ 

Of the 96 caregivers who knew what ORT was, 71 (74%) were able to explain the concept correctly (*Table 3.5*). The results of the statistical analysis show that there was a strong relationship ( $p < 0.000001$ ) between the caregivers that knew what ORT was and those that were able to explain how to mix it correctly.

**Table 3.5: The knowledge of caregivers of children (0–24 months) with regard to what oral rehydration solution was and if they were able to explain it correctly ( $n=123$ )**

		Were caregivers able to explain ORT?						P
		N	%	Correct (n)	%	Incorrect (n)	%	
Do you know what ORT is?	Yes	96	78	71	74	25	26	<0.000001 <sup>#</sup>
	No	27	22	1	4	26	96	

ML Chi-Square statistics <sup>#</sup> significant difference,  $p<0.05$ 

### 3.4.2.3 The effect of barriers to the realisation of the right to safe drinking water on the prevalence of diarrhoea in children 0–24 months

The scarcity of resources preventing caregivers from realising the right to safe drinking water of their children was reported in Section 3.3.3. In this section, the effect of the barriers to the realisation of the right to safe drinking water (including electricity, etc.) on the prevalence of diarrhoea in children 0–24 months is reported.

Eighty-nine percent ( $n=64$ ) of the children who had electricity in their homes ( $n=110$ ) did have diarrhoea previously (Table 3.6). However, statistics show that the availability of electricity had no significant impact on the prevalence of diarrhoea ( $p=0.14$ ).

**Table 3.6: The relationship between having electricity in the house and the prevalence of diarrhoea in children 0–24 months ( $n=110$ )**

		Availability of electricity in the house						P
		N	%	Yes (n)	%	No (n)	%	
How often does this child have diarrhoea?	Never	72	69	64	89	8	11	0.14
	Monthly	6	6	5	83	1	17	
	Fortnightly	20	19	19	95	1	5	
	Weekly	6	6	6	100	0	0	

ML Chi-Square statistics <sup>#</sup> significant difference,  $p<0.05$ 

The resources that were available in each household were compared with the prevalence of diarrhoea in the study population. The majority of those children that had never had diarrhoea previously, had access to electricity and electrical appliances for boiling water, preparing food and storing food and boiled water more conveniently. Forty-one percent ( $n=32$ ) of those that had a microwave had never had diarrhoea previously ( $p=0.5$ ). However the presence of these resources had no impact on the prevalence of diarrhoea in children 0–24 months (Table 3.7).

**Table 3.7: The comparison between available resources and if a child 0–24 months ever had diarrhoea previously (n=123)**

			N	%	Ever had diarrhoea				P
					Yes (n)	%	No (n)	%	
Resources	Electricity	Yes	110	89	42	38	68	62	0.27
		No	13	11	3	23	10	77	
	Fridge	Yes	91	74	33	36	58	64	0.9
		No	32	26	12	37.5	20	62.5	
	Stove	Yes	108	88	41	38	67	62	0.38
		No	15	12	4	27	11	73	
	Electric Kettle	Yes	100	81	38	38	62	62	0.5
		No	23	19	7	30	16	70	
	Microwave	Yes	53	43	21	40	32	60	0.5
		No	70	57	24	34	46	66	

ML Chi-Square statistics # significant difference,  $p < 0.05$ 

### 3.4.3 The knowledge and practices of caregivers which could be causative or preventative of diarrhoea

The objective was to investigate caregivers' knowledge of the causes and prevention of diarrhoea as well as their current practices for preventing diarrhoea. Where data about the same topic was obtained from both open-ended and closed-ended questions, the quantitative and qualitative results were discussed simultaneously.

#### 3.4.3.1 Self-reported knowledge regarding the cause of diarrhoea

Two-thirds of the caregivers (66%,  $n=81$ ) indicated they did not know the causes of diarrhoea. Those that indicated that they did know the causes of diarrhoea ( $n=42$ ) provided different explanations, such as 'they had eaten something that was contaminated', 'it was the water that caused it', or that it happens 'when children get teeth'. The perception of most of the caregivers with regard to diarrhoea was that it was something that happens but they don't really know why.

#### 3.4.3.2 Household practices

The caregivers were asked whether or not they had received advice on how to treat water to make it safe for human consumption (refer to Section 3.3.1). The results of this question were compared with the prevalence of diarrhoea among the children. In 44% ( $n=32$ ) of the cases where children had never had diarrhoea previously ( $n=72$ ), the caregivers had previously received advice on how to treat the water. Of the 20 children who had diarrhoea fortnightly 85% ( $n=17$ ) of the caregivers reportedly had never received any advice on how to treat the water (Table 3.8). However, whether

caregivers had received advice on how to treat water had made no difference to the prevalence of diarrhoea ( $p=0.09$ ).

**Table 3.8: The difference between whether the caregivers of children 0–24 months had received advice on how to treat water and the prevalence of diarrhoea ( $n=104$ )**

		Did you receive advice to treat water?						P
		N	%	Yes (n)	%	No (n)	%	
How often does this child have diarrhoea?	Never	72	69	32	44	40	56	0.09
	Monthly	6	6	3	50	3	50	
	Fortnightly	20	19	3	15	17	85	
	Weekly	6	6	3	50	3	50	

ML Chi-Square statistics # significant difference,  $p<0.05$

When boiling of water and the prevalence of diarrhoea in children were compared, it was found that only 7% ( $n=7$ ) of the caregivers who answered the question never boiled the water for household use. Of the 72 children who had never had diarrhoea previously, 10% ( $n=7$ ) of the caregivers never boiled the water, whereas 47% ( $n=34$ ) always boiled the water. Ironically, in the case of children who had diarrhoea fortnightly or weekly ( $n=26$ ), half of those caregivers (50%,  $n=14$ ) indicated that they always boiled the water (Table 3.9). No significant relationship between the variables ( $p=0.39$ ) was found; therefore one could conclude that although the majority of the caregivers boil their water, it has no significant impact on reducing the prevalence of diarrhoea.

**Table 3.9: The difference between whether caregivers of children 0–24 months boil the water and the prevalence of diarrhoea ( $n=104$ )**

		Do you boil the water?								P
		N	%	Never (n)	%	Sometimes (n)	%	Always (n)	%	
How often does this child have diarrhoea?	Never	72	69	7	10	31	43	34	47	0.39
	Monthly	6	6	0	0	4	67	2	33	
	Fortnightly	20	19	0	0	9	45	11	55	
	Weekly	6	6	0	0	3	50	3	50	

ML Chi-Square statistics # significant difference,  $p<0.05$

When the relationship between the storage of water and the prevalence of diarrhoea was investigated, it was found that 85% ( $n=61$ ) of the 72 caregivers whose children never had diarrhoea did store water (Table 3.10). It was found that stored water did not increase the prevalence of diarrhoea ( $p=0.33$ ).

**Table 3.10: The relationship between the storage of water by caregivers of children 0–24 months and the prevalence of diarrhoea in the children ( $n=104$ )**

		N	%	Do you store water?				P
				Yes (n)	%	No (n)	%	
How often does this child have diarrhoea?	Never	72	69	61	85	11	15	0.33
	Monthly	6	6	6	100	0	0	
	Fortnightly	20	19	16	80	4	20	
	Weekly	6	6	6	100	0	0	

ML Chi-Square statistics # significant difference,  $p<0.05$ **3.4.3.3 Infant feeding practices which could be causative or preventive of diarrhoea***Breastfeeding practices*

According to the literature, exclusive breastfeeding protects infants against infections<sup>29</sup> (such as diarrhoea), thus the practices of caregivers with regard to breastfeeding were investigated. Ninety-one percent ( $n=112$ ) of the 123 children were breastfed previously or were still being breastfed, while 9% ( $n=11$ ) had never been breastfed. The mean duration to breastfeed children was 25 weeks ( $SD\pm 23.2$ ).

The mean age until the cessation of breastfeeding of the group that had never had diarrhoea previously was 20 weeks and the mean age until when children were breastfed in the group that had diarrhoea previously was 34 weeks ( $p<0.01$ ). A non-parametric Mann–Whitney *U*-test was performed on these datasets. It was found that the group that had diarrhoea previously were breastfed longer than the group that had never had diarrhoea previously.

There were 48 (39%) children that were younger than 6 months, of whom 50% ( $n=24$ ) received breast milk only and the rest received mixed feeding. Eighty-one percent ( $n=39$ ) of the 48 children under the age of 6 months had never had diarrhoea previously. Fifty-four percent ( $n=21$ ) of those who had never had diarrhoea previously were exclusively breastfed and 46% ( $n=18$ ) received porridge, Purity baby foods, water or gripe water in addition to breast milk.

Table 3.11 illustrates the relationship between the type of milk a child received and the prevalence of diarrhoea. The type of milk a child drank had no significant effect on the prevalence of diarrhoea ( $p=0.34$ ).



**Table 3.11: The relationship between the type of milk that children 0–24 months receive and the prevalence of diarrhoea (n=104)**

		What type of milk is your child currently drinking?										P
		N	%	Breast milk (n)	%	Formula milk (n)	%	Cow's milk (n)	%	Other	%	
How often does this child have diarrhoea?	Never	72	69	48	67	20	28	2	3	2	3	0.34
	Monthly	6	6	2	33	2	33	1	17	1	17	
	Fortnightly	20	19	11	55	5	25	0	0	4	20	
	Weekly	6	6	5	83	1	17	0	0	0	0	

ML Chi-Square statistics # significant difference,  $p < 0.05$ 

*Practices related to food preparation and bottle or cup feeding which could be causative of diarrhoea*

Eighty-four percent ( $n=62$ ) of the children received their milk in a bottle and 16% ( $n=12$ ) received their milk in a cup. Thirty-two percent ( $n=24$ ) received expressed breast milk, 53% ( $n=39$ ) formula, 5% ( $n=4$ ) cow's milk and 10% ( $n=7$ ) other milk (including supplementation provided by the supplementation feeding programme).

In conformity with the instructions in the Road to Health Booklet<sup>33</sup> to prevent foodborne disease, all caregivers ( $n=51$ ) whose children received formula or other milk that needed to be reconstituted, used water that was boiled and cooled down before mixing the feeds (see Section 1.3.2). Ideally utensils need to be washed properly and sanitised. Seventy-eight percent ( $n=55$ ) of the caregivers that offered their children's milk in a bottle or cup washed it before and after use. Eighteen percent ( $n=13$ ) washed it after use and four percent ( $n=3$ ) washed it only once per day (Table 3.12).

When the relationship between how often the bottle or cup was washed and the prevalence of diarrhoea was investigated, 87% ( $n=34$ ) of the children whose caregivers ( $n=55$ ) washed the bottle or cup before and after use never had diarrhoea (Table 3.12). However, how often a child's bottle or cup was washed had no significant effect on the prevalence of diarrhoea ( $p=0.29$ ).

**Table 3.12: Comparison of the prevalence of diarrhoea with practices of caregivers of children 0–24 months (n=56)**

		N	%	When do you wash the bottle/cup?						With what do you wash the bottle/cup?					
				Before and after use (n)	%	After use (n)	%	Once per day (n)	%	Soap and water (n)	%	Bleach or Milton (n)	%	Only water (n)	%
How often does this child have diarrhoea?	Never	39	70	34	87	4	10	1	3	28	72	8	21	3	8
	Monthly	6	11	5	83	1	17	0	0	4	67	1	17	1	17
	Fort-nightly	9	16	4	44	3	33	2	22	7	78	2	22	0	0
	Weekly	2	4	1	50	1	50	0	0	2	100	0	0	0	0
<b>P</b>				0.29						0.99					

ML Chi-Square statistics # significant difference,  $p < 0.05$ 

Sixty-eight percent ( $n=50$ ) of the caregivers ( $n=74$ ) washed the bottles or cups with soap and water, 22% ( $n=16$ ) used chlorine solutions, 1% ( $n=1$ ) used salt water and 5% ( $n=4$ ) used only water. Of those caregivers whose children had never had diarrhoea previously, 72% ( $n=28$ ) washed the bottles or cups with soap and water and 21% ( $n=8$ ) used chlorine solutions (Table 3.11). Therefore the medium used to wash the bottle or cup had no significant effect on the prevalence of diarrhoea ( $p=0.99$ ).

#### *Practices related to complementary feeding which could be causative of diarrhoea*

Seventy-one percent ( $n=87$ ) of the 123 children were consuming complementary food at the time of data collection. The mean age at which children started with complementary feeding was 4.8 months ( $SD \pm 2.05$ ).

A statistically significant difference was found between the consumption of complementary food and the prevalence of diarrhoea ( $p=0.0008$ ). It can be concluded that consuming complementary foods has a significant effect on increasing the prevalence of diarrhoea (Table 3.13).

**Table 3.13: Comparison of the prevalence of diarrhoea with whether or not a child 0–24 months was already eating (n=104)**

		N	%	Does this child eat?				P
				Yes (n)	%	No (n)	%	
How often does this child have diarrhoea?	Never	72	69	31	43	41	57	0.0008 <sup>#</sup>
	Monthly	6	6	0	0	6	100	
	Fortnightly	20	19	1	5	19	95	
	Weekly	6	6	1	17	5	83	

ML Chi Square statistics <sup>#</sup> significant difference,  $p < 0.05$ **3.4.3.4 Personal hygiene practices and household sanitation and the impact on diarrhoea in children 0-24 months**

Proper personal hygiene and household sanitation impacts directly on the prevention of diarrhoea.<sup>29</sup>

When the relationship between sanitation facilities and the prevalence of diarrhoea was investigated, it was found that of those children that never had diarrhoea previously, 31 (43%) lived in a house with a flush toilet located inside the house. Of the group who had diarrhoea fortnightly (n=20), 11 (55%) had an outside pit latrine (*Table 3.14*). It was found that the type of sanitation facilities had no significant impact on the prevalence of diarrhoea ( $p=0.37$ ) (*Table 3.14*).

**Table 3.14: The relationship between the available sanitation facilities at a house and the prevalence of diarrhoea in children aged 0–24 months (n=104)**

				Sanitation facilities								Drinking water					
		N	%	Outside flush toilet (n)	%	Inside flush toilet (n)	%	Outside pit latrine (n)	%	No toilet (n)	%	Tap inside house (n)	%	Tap outside house (n)	%	Public tap (n)	%
How often does this child have diarrhoea?	Never	72	69	20	28	31	43	21	29	0	0	39	54	32	44	1	1
	Monthly	6	6	2	33	3	50	1	17	0	0	4	67	2	33	0	0
	Fort-nightly	20	19	2	10	6	30	11	55	1	5	5	25	14	70	1	5
	Weekly	6	6	1	17	2	33	3	50	0	0	3	50	3	50	0	0
P				0.37								0.06					

ML Chi-Square statistics <sup>#</sup> significant difference,  $p < 0.05$

Fifty-four percent ( $n=39$ ) of the group ( $n=72$ ) who had never had diarrhoea previously had taps inside their houses ( $p=0.06$ ). This is in contrast with the group who had diarrhoea fortnightly ( $n=20$ ), where the majority (70%,  $n=14$ ) had taps outside their houses (Table 3.14).

Ninety-four percent ( $n=98$ ) of the 104 caregivers washed their hands with soap and water. When asked to describe when they habitually washed their hands, the answers varied: 'after using the toilet', 'before eating', or 'before breastfeeding the baby'. When the relationship between how they washed their hands and the prevalence of diarrhoea was investigated, it was found that in the group that had never had diarrhoea previously, 94% ( $n=68$ ) washed their hands with soap and water (Table 3.15). How the caregivers washed their hands had no effect on the prevalence of diarrhoea ( $p=0.78$ ).

**Table 3.15: The relationship between how caregivers washed their hands and the prevalence of diarrhoea in children 0–24 months ( $n=104$ )**

		How do you wash your hands?						
		N	%	Soap and water (n)	%	Only water (n)	%	P
How often does this child have diarrhoea?	Never	72	69	68	94	4	6	0.78
	Monthly	6	6	5	83	1	17	
	Fortnightly	20	19	19	95	1	5	
	Weekly	6	6	6	100	0	0	

ML Chi-Square statistics # significant difference,  $p<0.05$

#### 3.4.4 The knowledge, attitudes and counselling practices of nursing practitioners in managing the prevalence of diarrhoea

Nursing practitioners play a crucial role in health promotion and education to empower caregivers to fulfil their duty to take care of their children.<sup>19</sup>

##### 3.4.4.1 The knowledge of nursing practitioners in managing the prevalence of diarrhoea

In depth knowledge of managing the prevalence of diarrhoea will impact on the ability of nursing practitioners to provide appropriate interventions and counselling. When asked to describe their personal experience in treating children with diarrhoea, the nursing practitioners expressed the opinion that if children were 'malnourished and dirty', they were at greater risk of contracting diarrhoea; furthermore it was generally those children that were already severely dehydrated when they were brought to the clinic. They also mentioned that "water is important to prevent and treat dehydration in children with diarrhoea".

“I will say that caregivers, especially when a baby receives formula feeds, don’t mix the feeds correctly. And the caregivers’ personal hygiene is not optimal and the cleaning of the bottles and stuff is also not optimal. It is worse in some parts of the community than in others. It also goes hand in hand with neglect. The mothers refuse to give breast milk and then they cannot afford formula and then when the formula is nearly finished, they prepare diluted feeds to make the milk last longer. They also don’t have the facilities to prepare the formula hygienically. (Nursing practitioner) (Translated from original Afrikaans transcript)<sup>q</sup>”

Nursing practitioners agreed that the water quality influences the prevalence of diarrhoea. According to them, this is especially true when there are ‘more than two or three cases from a specific area that has diarrhoea simultaneously’. They were also aware that there are times during the year that the prevalence of diarrhoea increases.

In response to the question if there are any protocols or Standard Operating Procedures (SOPs) available in the clinics for the management of diarrhoea, it was encouraging that all nursing practitioners knew about the Integrated Management of Childhood Illnesses (IMCI) guidelines for the treatment of diarrhoea. According to them, ‘patient history is very important, and to check for dehydration in the patient, because children can become dehydrated much faster than adults’.

#### **3.4.4.2 The attitudes of nursing practitioners in managing the prevalence of diarrhoea**

Nursing practitioners considered illiteracy as a factor that has a great impact on caregivers’ practices when dealing with water shortages and unsafe water as described by this quote:.

“Water is really one of the most crucial resources and illiteracy contributes to complicate this matter. But frequent and continued health education plays an important role in the rural areas because if you have an illiterate mother and they struggle with water ... if they find a sustainable water source, then one could teach them to boil the water and to add bleach. Then it is actually safe to use. (Nursing practitioner) (Translated from original Afrikaans transcript)<sup>r</sup> “

<sup>q</sup> “Ek sal sê dat moeders, veral by babas wat formule voedings kry, dit word nie korrek voorberei nie. En die ma se persoonlike higiëne is nie voldoende nie en die skoonmaak van die bottels en die goed is ook nie voldoende nie. In sekere dele van die gemeenskap is dit erger as in ander. Gaan ook gepaard met verwaarloosings. Die mamma’s weier om bors te gee en dan kan hulle nie formule bekostig nie en dan as die melk min raak word dit al hoe flouer voorberei. Hulle het ook nie die geriewe om die formule voor te berei nie.” – Original Afrikaans quote by nursing practitioner.”

<sup>r</sup> “Water is rêrig soos ek sê ‘n noodsaaklike middel vir ons en ongeletterdheid dra ook nou nie daartoe by nie. Maar gereelde en aanhoudende gesondheidsopvoeding speel ‘n baie belangrike rol hier by ons in die platteland want as jy ‘n ongeletterde mamma het en jy sukkel met water – as hulle bv by ‘n standhoudende plekkie water kry dan kan ‘n mens hulle darem oplei om te sê kook die water, jy kan bleikmiddel ingooi en dan daarvan af kan die water veilig wees om te gebruik.” – Original Afrikaans quote by nursing practitioner.

The nursing practitioners were genuinely concerned about the wellbeing of the children and they regarded caregivers' lack of interest as alarming. According to the nursing practitioners, only a few caregivers are able to tell them whether their child had lost weight or what the child weighed.

The nursing practitioners concluded that caregivers didn't really care that diarrhoea could influence their children's nutritional status. Other factors according to the nursing practitioners that contributed to the caregivers' apathy and lack of care were the poor socio-economic circumstances that the majority of people in the community lived in, as well as alcohol abuse. According to the nursing practitioners many children brought in that were severely dehydrated and malnourished had caregivers with a history of alcohol abuse, "they are just too drunk to care ... "

#### ***3.4.4.3 The counselling practices of nursing practitioners in managing the prevalence of diarrhoea***

Caregivers were taught by nursing practitioners to obtain water from 'safe places like reservoirs at the clinics, schools or hospitals' and to not scoop water from 'unsafe places like rivers and stationary water sources'. Furthermore, they should also be taught how to save water. "Saving water is the key to ensuring that there will be water at all times."

People in the communities were also taught to report unsafe water to the health inspector or immediately report to the municipality when there was no water.

Different and often contradictory advice was given to caregivers by nursing practitioners about the type of food to offer a child who presented with diarrhoea. There were contradictions in the advice they gave about the consumption of breast milk while a child had diarrhoea. Some of the nursing practitioners said that children could continue with breastfeeding when they had diarrhoea, while others said that breastfeeding should be stopped for at least 24 hours when a child had diarrhoea or until the stools were properly formed again. According to some nursing practitioners, children could eat solids when suffering from diarrhoea, but a child should not be forced to eat. Food with a high-fibre content like brown bread should be avoided. Foods that could be given included maize meal porridge and bananas "for the electrolytes". An adequate fluid intake was regarded as very important: "If it is a child that still drinks milk, milk and water intake can be alternated so that the child gets all the important minerals and nutrients."

It was evident from the interviews that the nursing practitioners provided caregivers with valuable information. Before a caregiver and child leave the hospital or clinic after a bout of diarrhoea, the caregivers are thoroughly counselled in respect of a few very important topics. If it is a child that is

formula fed, they explain to the mother how to mix the feeds correctly and hygienically and how to sterilise the bottles and teats. The caregivers were also counselled on the safe preparation of food, how to correctly store water and to boil water before use. The nursing practitioners also ensure that the caregivers know exactly how to prepare the sugar-salt solution. Caregivers were taught about personal hygiene by nursing practitioners and also when to wash their hands. Caregivers were taught how important it was to teach their children to wash their hands so that they would routinely wash their hands from a very young age.

### **3.5 CONCLUDING STATEMENT ON RESULTS**

In this chapter the results from the questionnaires and the semi-structured interviews were presented. Quantitative and qualitative results were interpreted in an integrated way. In some instances significant results were discovered and information of value was revealed.

The age of the children had a significant effect on the prevalence of diarrhoea; those that had never had diarrhoea previously were younger than those that had diarrhoea previously. The caregivers that knew about ORT were also able to explain it correctly. Statistically significant ( $p < 0.05$ ) differences were found between the prevalence of diarrhoea in children that were eating complementary foods and those who were not eating complementary foods. The exclusive breastfeeding rate of the study population was also very low and that also had an impact on the prevalence of diarrhoea in children. Caregivers perceived the lack of a constant water supply as a barrier in realising the right to water of their children.

Nursing practitioners perceived the intermittent water supply, the poor quality of the water and the caregivers' actions as barriers in realising the right to water of children aged 0–24 months. Nursing practitioners were knowledgeable about the management of diarrhoea as well as the treatment and prevention of dehydration.

The implications of the results are discussed in Chapter 4.

## **CHAPTER 4: DISCUSSION OF FINDINGS**



## 4.1 INTRODUCTION

In this chapter the results of the study are discussed. The main aim of this study was to investigate whether selected duty-bearers are fulfilling their responsibilities towards the realisation of the right to water of children (0–24 months) residing in Colesberg during the nutritional management of diarrhoea in primary health care institutions. The objectives were broadly divided into two groups, namely objectives pertaining to the realisation of the child's right to safe and adequate water and objectives pertaining to the possible link between water and diarrhoea. The knowledge and practices of caregivers and the knowledge, attitudes and practices of nursing practitioners with regard to the causes and management of incidences of diarrhoea are discussed accordingly. The perceptions of caregivers and nursing practitioners with regard to barriers to realise the right to water comprise the latter part of the discussion.

Water is part of every cell and tissue in our bodies and the body needs water to survive. This is especially important for children aged 0–24 months.<sup>11</sup> When compared with adults, infants have a higher percentage of water in their bodies, making them more vulnerable to fluid and electrolyte imbalances.<sup>57</sup> Infants are also not able to tell their caregivers when they are thirsty and that can cause dehydration much faster in infants than in adults.<sup>57</sup> Without access to clean, safe water, the right of the child to water is violated.<sup>4,19</sup>

As discussed in the literature review, the Right to Water of all people and especially children is protected in various human rights instruments, including the International Covenant on Economic, Social and Cultural Rights (ICESCR) (1966),<sup>12</sup> Convention on the Rights of the Child (CRC) (1989),<sup>13</sup> African Charter on the Rights and Welfare of the Child (1990),<sup>14</sup> as well as the Constitution of the Republic of South Africa (1996)<sup>15</sup>.

It is stated in most of these instruments that the state has various obligations towards the realisation of human rights in a country. These obligations as defined by Eide in 1989 are the obligation to respect, to protect and to fulfil.<sup>54</sup> Although the state remains accountable for its obligations, there are various actors, known as duty-bearers, which play a role in the realisation of human rights (*Figure 1.2*). According to the concept developed by Kent known as the “nested rings of responsibilities” towards the realisation of the child's human rights, the caregiver is the duty-bearer closest to her child but she needs the support of the other duty-bearers such as the community, healthcare professionals and local government to fulfil her responsibilities towards her child.<sup>3,55</sup>

For the purpose of this study the focus was on the caregivers and nursing practitioners as duty-bearers in the realisation of the right to water of children (aged 0–24 months); however the role of local, national and international government as duty-bearers are also discussed.<sup>3</sup>

## **4.2 INVESTIGATION OF THE REALISATION OF THE CHILD’S RIGHT TO SAFE AND ADEQUATE WATER**

### **4.2.1 The knowledge and practices of caregivers of children 0–24 months regarding water for household use**

At the time when this study was conducted, the community of Colesberg was grappling with water shortages and the quality of the water was frequently sub-optimal. The researcher deemed it important to establish the extent of the knowledge and practices of caregivers to treat water prior to household use to protect their children from potential complications associated with waterborne disease such as gastroenteritis.

The majority of the caregivers regarded the water as unsafe and not suitable for human consumption. Caregivers’ perceptions were based on their observations that the water often had an unpleasant odour and colour. Owing to personal experience, caregivers were also aware that the water sometimes caused gastroenteritis.

It is the goal of the General Comments to define rights in minimum core standards. According to General Comment 15 (12 (b)) on the right to water (2002), the availability and quality of water are both primary requisites for realising the right to water.<sup>11</sup> Similarly, Section 27 of the Constitution of the Republic of South Africa states that “everyone has the right to have access to sufficient ... water”.<sup>15</sup>

Furthermore, it is stated in General Comment 15 that “special attention is to be paid to providing sufficient water to sustain human life, including both drinking water and water required for production of food in order to prevent starvation”.<sup>4</sup> The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this fundamental human right.<sup>15,24</sup> This means that the South African Government must do everything in its power to ensure that the community of Colesberg has adequate water that is free from organisms that can cause harm and that is also free from unpleasant odours and colours.

The Department of Water Affairs issued a warning to the public of Umsobomvu Municipality in 2012 not to consume any tap water unless treated at home, either by boiling the water or adding bleach to the water.<sup>49</sup> However there was no evidence that the local municipality issued any

warnings or distributed any promotional material on how to treat water at home. It can be argued that the Local Government (Umsobomvu Municipality), as representative of the State, failed to provide safe water to this community; therefore it is their duty to promote the treatment of water.

In the execution of the South African government's obligation to facilitate the right to safe and adequate water, guidelines were compiled, namely the "Guidelines for Compulsory National Standards (Sec 9), Norms and Standards for Water Services Tariffs (Sec 10) and Water Services Provider Contract (S19(5))" (2002) (henceforth referred to as "Norms and Standards for Water Services (2002)"). This set of guidelines stipulates "the minimum standard for basic water supply services includes the provision of appropriate education in respect of effective water use ..."<sup>24</sup>

#### **4.2.2 Coping strategies used by caregivers of children 0–24 months during periods of water shortages or poor water quality**

Colesberg experienced periods when there was no water available. At one stage this was a daily occurrence and people had to use coping strategies. This situation is a transgression of the "Norms and Standards for Water Services" (2002) which stipulates the provision of "a minimum quantity of potable water of 25 litres per person per day or 6 kilolitres per household per month – at a minimum flow rate of not less than 10 litres per minute; within 200 metres of a household; and with an effectiveness such that no consumer is without a supply for more than seven full days in any year".<sup>24</sup>

In line with a study by Clasen in 2010 which reported that the boiling of water is effective to improve the quality of water,<sup>58</sup> caregivers in this study boiled water when they doubted the quality of the water. Clasen however cautioned that although the boiling of water is regarded as effective, studies showed that even after water was boiled, there were instances where low to moderate levels of faecal contamination were still found, possibly due to unsafe storage of parboiled water. This implies that emphasis also has to be placed on safe storage, and even though the home treatment of water can sometimes be sufficient, it should never replace the objective of safe, sufficient and accessible water supplies.<sup>58</sup>

All the caregivers in this study were of the opinion that it is their own as well as their children's basic human right to have access to water and explained that no human being can 'survive without water'. This is especially true in children younger than 24 months who have a requirement of 150ml/kg of water per day. Infants have higher water requirements than adults and older children because their kidneys have a limited capacity to handle the renal solute load, they have a higher percentage of body water, and they have a larger surface area per unit of body weight.<sup>10</sup> This corresponds with the stipulation in General Comment 15 on the right to water (2002),<sup>11</sup> that the human right to water is vital for leading a life of self-esteem.

The gravity of the unreliable supply of potable water is highlighted in a related situation in Mpumalanga. Residents of the town Carolina, Mpumalanga, went to court in 2012 when their water source was contaminated by acid mine water. The applicants made the case that “every day that the residents of Carolina do not have access to an effective and reliable supply of potable water, constitutes a gross infringement of their constitutional right to have access to water”.<sup>59</sup> In line with regulation 3(b) relating to compulsory national standards and measures to conserve water (Government Notice R. 509 published in the *Government Gazette* 22355 (8 June 2001)), the court found that the Acting Executive Mayor and the Municipal Manager of the Gert Sibanda District Municipality had to provide temporary potable water to the residents of Carolina, within 72 hours of the order of the High Court. It was also ordered that steps should be taken to ensure that potable water could once again be supplied through the water supply services.<sup>59</sup>

The Norms and Standards for Water Services (2002) stipulate minimum standards that municipalities have to adhere to, to ensure that the community’s right to water will be fulfilled.<sup>24</sup> It can therefore be argued that should the municipality of Umsobomvu fail to provide safe, sufficient and accessible water, the municipality of Umsobomvu has the obligation to provide citizens with suitable containers to enable them to access the potable water made available in trucks carrying water supplies.

Additionally, the municipality needs to promote the treatment and safe storage of water by educating the community about optimal water storage techniques. It is common practice in areas where there are frequent water shortages to store water for household use. Although the majority of the caregivers in this study had access to water, more than half had taps outside their houses, which compelled them to store water in containers for easy access.

In 2009 Clasen reported that the safe storage of water was crucial in providing safe drinking water in rural areas without a sustainable water supply. The safety of the stored water depends on the cleanliness of the container the water is stored in. Ideally a new container should be used for the sole purpose of storing water, but unfortunately people who have limited funds often use any container they deem suitable for water storage. It could therefore be argued that if the government is not able to provide safe and sufficient water, it will be beneficial for the community if the government could explore cost-effective measures to ensure the availability of safe water by providing new containers to store water, accompanied by instructions for the treatment and safe storage of water.<sup>60</sup>

#### **4.2.3 The perceptions of caregivers of children 0–24 months of barriers to the realisation of the right of their children (0–24 months) to safe drinking water**

From caregivers' responses to the open-ended questions, the following barriers to the realisation of the right of their children (0–24 months) to safe drinking water were identified: intermittent water supply, poor water quality, taps in yards instead of within households, inadequate sanitation facilities, and limited availability of electricity and other resources.

Various human rights instruments stipulate the right to water as a basic human right, which implies it is a universal right and no human being is able to survive without it. According to General Comment 15 on the right to water (2002), “an adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, personal and domestic hygienic requirements”.<sup>4</sup> The Convention on the Rights of the Child states that “to combat disease and malnutrition ... the provision of adequate nutritious foods and clean drinking-water ...”<sup>13</sup> is essential.

Even though caregivers have access to water inside their homes or at outside taps within 200 metres from their household, there were periods of time<sup>45-48</sup> when there was no water available for longer than 24 hours at a time, creating a barrier to the full realisation of the right to water for children younger than 24 months. As previously discussed, caregivers were aware that poor quality water and intermittent water supply undermines their right to utilise safe potable water in their households. The perception of the caregivers was that it was the responsibility of the municipality (local government) to provide them with water but they displayed no direct insight into what their own roles were to honour this right. Some of the caregivers had the insight to pay their water and electricity bills, or otherwise face having these utilities suspended.

The availability of household sanitation facilities that impact on the accessibility and quality of water to households was investigated in this study. In a publication by the World Health Organization (WHO) it was found that “poor water supply, sanitation and personal and domestic hygiene contribute substantially to diarrhoeal disease”, especially in sub-Saharan African Countries.<sup>61</sup> When the above-mentioned resources are not available, it prevents caregivers to realise the right to water of their children younger than 24 months. During January 2014 (this happened during the period of data collection) the Minister of Water Affairs announced that “water shortages and lack of proper sanitation will soon be a thing of the past for the communities of Colesberg in the Northern Cape”, when she announced multimillion rand water projects for the region, which included the upgrade of the old infrastructure originally designed for much smaller communities.<sup>62</sup> Since this announcement was made, the researcher has observed that periods of water shortages have decreased and water supply to Colesberg has been relatively uninterrupted.

The caregivers felt angry and powerless that water shortages affected their children because the caregivers could not care for them optimally as it impacted negatively on the fulfilment of other rights such as the right to food and to lead a life of human dignity. The situation described above is contradictory to Article 2(10) of the South African Constitution, which states “everyone has inherent dignity and the right to have their dignity respected and protected”.<sup>15</sup> Therefore it can be concluded that not only was citizens’ right to water violated, but also their inherent right to dignity.

The World Health Organization (2005) states that “drinking water supplies are often microbially contaminated and, in many cases ... people may treat their water at the household level to make it safer to drink”.<sup>63</sup> This clearly indicates the need for appropriate resources. Therefore it could be argued that the availability of household resources would have an effect on reducing the incidence of diarrhoea in children, since caregivers would be able to boil water more readily and they would also be able to store food and water more safely.

The majority of caregivers reportedly had electricity in their homes, enabling them to boil water with electricity, which is a more effective medium than other means of boiling water. When the availability of electricity was compared with the prevalence of diarrhoea, it was statistically significant that the majority of the group that had never had diarrhoea previously, had electricity in their homes. It can therefore be concluded that although it is a barrier when electricity is not available, electricity is provided by the municipality to the majority of the community and therefore this need had been met.

#### **4.2.4 Perceptions of nursing practitioners of the child’s right to water and barriers to the realisation of the right to safe drinking water for children (0–24 months)**

Based on the concept of the nested rings of responsibilities of various duty-bearers towards the realisation of the child’s human rights,<sup>3,55</sup> nursing practitioners can be regarded as the next level of duty-bearers responsible for the realisation of the human rights of children younger than 24 months by supporting their caregivers. The nursing practitioners in this study were fully aware of the importance of water for the health and child survival. They mentioned that caregivers used alternative water sources during water shortages and that could lead to a higher probability of a diarrhoeal outbreak. Apart from recognising the same barriers as the caregivers, to realising the right to water of children younger than 24 months, namely the intermittent water supply and the poor quality of the water, the nursing practitioners regarded the caregivers themselves as a barrier. According to the nursing practitioners, it remains the responsibility of the caregivers to apply the knowledge they gain from the information provided by nursing practitioners on how to care for their children suffering from diarrhoea and how to administer the oral rehydration solution. It is questionable whether caregivers do this diligently. Although the nursing practitioners perceived

some caregivers as irresponsible and uncaring, the caregivers still expressed their frustration and anger when there was no water available, preventing them from caring optimally for their children.

The nursing practitioners recognise the barriers created by water shortages and by educating caregivers on correct storage procedures they partially fulfil their responsibility towards realising the right to water of children younger than 24 months. However, the nursing practitioners need to be encouraged to advise the community to report problems with water supply to the responsible officials at the municipality and to hold those officials accountable.

## **4.3 THE PREVALENCE AND MANAGEMENT OF DIARRHOEA**

As human rights are indivisible and interdependent, the right to water is also a requirement for the fulfilment of other human rights such as the right to the highest attainable standard of health (General Comment 15 art. 12, para. 1), as well as the rights to adequate housing and adequate food (General Comment 15 art. 11, para. 1).<sup>4</sup>

### **4.3.1 General information about morbidity of children (0–24 months) included in the study population**

According to General Comment 15 on the Right of the Child to the enjoyment of the highest attainable Standard of Health (art. 24), issued in 2013 by the UN Committee on the Rights of the Child, the right is interpreted as “an inclusive right ... to timely and appropriate prevention, health promotion, curative, rehabilitative and palliative service ... ”<sup>20</sup> This means that programmes and protocols need to be in place to prevent disease and combat malnutrition. These programmes and protocols should include the provision of information to assist caregivers in caring for their children and in preventing diseases such as diarrhoea. Article 24(2(c)) of the Convention of the Right of the Child states: “To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology ... ” General Comment 15 on the child’s right to health’s interpretation of Article 24(2(c)) of the Convention of the Right of the Child states that this includes “immunization against childhood illnesses”.<sup>20</sup> The inclusion of information pertaining to the prevention of diarrhoea and recording rotavirus immunisations in the Road to Health Booklet<sup>33</sup> bears evidence of the South African government’s fulfilment of its obligation to protect the right of the child to optimal health.

The Integrated Nutrition Programme (INP) of the Department of Health has provided a Roadmap for Nutrition with the goal to direct nutrition-related activities in the health sector to achieve the goals set out by the INP.<sup>2</sup> This strongly indicates that the National Department of Health has the intent to fulfil children’s rights. Mothers receive the Road to Health Booklet at the birth of their babies and are advised to visit the clinic according to the schedule indicated in the Road to Health



Booklet.<sup>33</sup> On its part the provincial government fulfils the same responsibility by providing clinics for administering immunisations and for growth monitoring. In Colesberg, specific weekdays are allocated to children, generally known as 'well baby days'.

It was deemed important to establish whether caregivers in Colesberg fulfilled their responsibility to take care of their children's health by attending health clinics regularly according to the requirements. The results of the quantitative questionnaire provided evidence that most caregivers attended health clinics when necessary, especially when their children were ill. Therefore it can be argued that they use the resources that are available to them and in that way are fulfilling their roles as duty-bearers with regard to the health of their children.

#### **4.3.2 Diarrhoea in children (0–24 months)**

In a systematic review published in the *Lancet* in 2012, diarrhoea is considered globally as one of the leading causes of death in children under the age of five.<sup>6</sup> This is especially true in Africa and it is also more prevalent in rural areas.<sup>5</sup>

In order to discuss the effect of diarrhoea on children's right to water, it was necessary to determine the prevalence of diarrhoea in children aged 0–24 months for this study population. Although the majority of the children, mostly the younger children (<6 months), had never previously had diarrhoea, one-third of the study population reportedly had diarrhoea monthly, fortnightly or weekly. One possible explanation for this finding could be the protective effect of exclusive breastfeeding (discussed in more detail in the next section). Children who were breastfed could be protected from diarrhoea by the antibodies in the breast milk. The predominant immunoglobulin in human milk assists in protecting the infant's gastrointestinal tract by binding iron to vitamin B<sub>12</sub> and therefore makes these nutrients unavailable for the growth of pathogens in the infant's gastrointestinal tract. This leads to the protection of breastfeeding infants against infectious diseases like diarrhoea.<sup>63</sup>

Furthermore, current recommendations included in the Road to Health Booklet encourage a delay in introducing complementary food until the age of six months. When caregivers did not breastfeed their children younger than 24 months, or when complementary feeding was already started, caregivers were also more dependent on water to prepare the formula feeds of their children, to wash bottles or cups, and also to prepare food. This could also have increased the children's risk of contracting diarrhoea.<sup>33</sup>

A small majority of caregivers in this study were aware that children should consume food while suffering from diarrhoea. This is in accordance with the World Health Organization (WHO)



guidelines recommending that food should not be withheld from children suffering from diarrhoea. Nutrient-rich food should still be offered, even when children have no appetite, to guarantee that the adequate absorption of nutrients will take place to ensure that the child will continue to grow and gain weight.<sup>64</sup>

A recent systematic review in low- and middle-income countries in 2013 confirmed the importance of continued feeding during diarrhoeal episodes to limit the nutritional consequences of a reduced intake, digestion and absorption of essential nutrients. This is even more important in low- and middle-income countries with restricted access to specialised infant formulas, where continued breastfeeding as well as the use of age-appropriate, locally available food should be encouraged in most acute diarrhoea cases.<sup>65</sup> Children who do not receive food while having diarrhoea will suffer weight loss, the diarrhoea will last longer, and the gut function will take longer to return to normal.<sup>64</sup>

According to the guidelines of the WHO, it is only important to consider intolerance to milk when the volume of stools increases and if the signs of dehydration are aggravated or return. A child with milk intolerance will most likely lose weight. Breastfeeding should always be continued.<sup>64</sup> Findings from this study showed the need for continued health promotion to caregivers as more than half of the caregivers in this study answered incorrectly that a child should not drink milk while experiencing diarrhoea.

It was encouraging to find that the majority of caregivers in this study answered correctly that a child should drink water while having diarrhoea, indicating a willingness to try to prevent dehydration. Children younger than 24 months are unable to tell their caregivers when they are thirsty. Therefore it is the duty of caregivers to offer water or oral rehydration treatment (ORT) to their children to prevent dehydration.<sup>57</sup> However it is the duty of nursing practitioners to emphasise the point that ORT should be offered because water alone will not prevent and treat dehydration.

Instructions for the mixing and administering of oral-rehydration solution are clearly explained in the Road to Health Booklet<sup>33</sup> to assist caregivers in the management of childhood diarrhoea. Oral rehydration solution is a simple cost-effective measure that is proven to prevent and treat dehydration during diarrhoeal episodes in children aged 0–24 months and to decrease mortality due to diarrhoea. In a systematic review by Munos et al. in 2010, it was proposed that diarrhoea mortality could decrease substantially when oral rehydration solution is used.<sup>66</sup>

The nursing practitioners taught the caregivers how to mix the oral rehydration solution, especially when they brought their children to the clinic while experiencing diarrhoea.<sup>33</sup> The majority of caregivers knew what the recipe for oral rehydration solution was. Education, and especially health promotion, play a significant role in distributing information about and knowledge of cost-effective

and simple measures like ORT and the treatment of dehydration.<sup>30</sup> In an Editorial by Wittenberg in 2013, it was emphasised that caregivers should be helped to understand that ORT is a simple solution to replace fluid losses and should be supported to introduce early re-feeding, including continued breastfeeding. By helping caregivers understand this, they become empowered to deal efficiently with most cases of diarrhoea in their children.<sup>67</sup>

Similar to Munos<sup>66</sup>, this study found that the coverage of using ORT remains low despite the effectiveness thereof and the fact that caregivers are taught how to prepare the oral rehydration solution. It was discouraging to find that fewer than half of those caregivers whose children had had diarrhoea previously could recall what ORT was. Since this study did not investigate diarrhoea mortality, it is difficult to establish the impact of this finding, since ORT is used in preventing and treating dehydration and not diarrhoea itself.

#### **4.3.3 The knowledge and practices of caregivers which could be causative or preventative of diarrhoea**

Very few of the caregivers knew why their children contracted diarrhoea. In a systematic review by Bhutta et al. in 2005, it was found that maternal education plays an important role in the survival of infants. It is therefore important to promote the ability of mothers to care for their children through basic education.<sup>30,68</sup>

In a systematic review by Gakidou et al. in 2010, a positive correlation between the education of women and the reduction in child mortality was found.<sup>29</sup> Although there was no statistical significance between the level of education of the caregivers and prevalence of diarrhoea of the children in this study, the majority of the caregivers whose children had not had diarrhoea previously had received a secondary education. Therefore it seems that caregivers with a higher education are more likely to prevent and treat diarrhoea in their children.

In a systematic review by Bhutta et al. in 2005, the effect of education on the outcome of infant mortality was reviewed. The authors of the study concluded that community participation was the key to the success of educational strategies.<sup>68</sup> It is therefore important that the emphasis should not be only to educate caregivers, but also the rest of the community. An effective way to address this is through Participatory Learning and Action (PLA) research which is a community development approach through which facilitators work together with communities to help them to establish what their needs are, identify solutions and create and implement a plan of action. This method empowers communities to take action in dealing with their needs.<sup>69</sup>

The question whether caregivers had received any advice on how to treat the water was compared with the prevalence of diarrhoea to establish if the knowledge has had any effect on the prevalence of diarrhoea. However, it was found that the children of those caregivers that received advice to treat the water or who boiled the water, did not necessarily have a lower incidence of diarrhoea. Therefore other factors have to be taken into consideration. Boiling of water and advice to treat water are not the sole factors contributing to a decrease in the prevalence of diarrhoea; how water was stored, personal and household hygiene and how food was prepared and stored are further considerations.

As seen in the 2010 article by Clasen, boiling of water is one of the most effective treatments in making water safer for consumption.<sup>58</sup> Caregivers were doing their best to fulfil their role as duty-bearers to prevent diarrhoea and to realise the right of their children towards water. It is, however, important that they receive the necessary advice to help them.

Although diarrhoea is one of the leading causes of death in children under the age of five years, it is a preventable disease.<sup>6,7</sup> Exclusive breastfeeding is one of the most important and cost-effective practices to prevent diarrhoea and protect infants. There are several factors that undermine optimal breastfeeding practices, such as the aggressive marketing of breast milk substitutes and the free distribution of infant formula to prevent mother-to-child transmission of HIV (in the past). Formula feeding is practised frequently by mothers and this increases the risk of malnutrition and diarrhoea.<sup>40,70</sup>

The exclusive breastfeeding rate in South Africa remains low (8.3% in 2008),<sup>71</sup> while the infant mortality rate remains high. Government showed its commitment to this aspect of the child's right to health by introducing the "Tshwane Declaration of Support for Breastfeeding in South Africa" in August 2011.<sup>40,70</sup> The "Tshwane Declaration" actively promotes, protects and supports exclusive breastfeeding.<sup>70</sup>

The low rate of exclusive breastfeeding found in this study population raises concern because the majority of caregivers were unemployed and were dependent on child support grants. Half of the group of children that were younger than six months were exclusively breastfed, which was higher than the reported rate of 36% for exclusive breastfeeding in the Umsobomvu Sub-District for 2011/12<sup>52</sup> as well as the South African rate of 8.3%.<sup>71</sup> Literature reports various reasons why mothers do not breastfeed exclusively. These can include inadequate antenatal education; the perceived comfort and ease of formula feeding; the misperception of insufficient milk supply; mothers not receiving sufficient support to continue with breastfeeding; the previous regime of distribution of free formula at clinics; mothers returning to work; or early introduction of solids.<sup>70,72</sup>

However, mothers' reasons for not breastfeeding were beyond the scope of this study and warrant further investigation.

As mentioned previously, the group of children prone to experiencing incidents of diarrhoea, was breastfed for longer periods than the group (younger than six months) that had not had diarrhoea previously. Possible explanations were that infants who were exclusively breastfed had not been exposed to microorganisms through the provision of complementary foods or the effect of feeding vessels in contact with unsafe water. The children in this study that received expressed breast milk, formula, cow's milk or other milk, were mostly fed by bottle and only a few of the children were fed by cup. It is known that bottles and cups which are not cleaned properly become a potential source of microorganisms.<sup>75</sup> An analysis of the survival of South African children under the age of five years showed that the practice of exclusive breastfeeding is one of the factors that has shown a reduction in under-five mortality.<sup>73</sup> Furthermore, in the *Lancet* series on child survival it was reported that infants who were not exclusively breastfed were at a higher risk of dying from diarrhoea.<sup>73</sup> The finding that the majority of children younger than 24 months in this study received infant formula is a disconcerting one, as notwithstanding the nutritional concerns, the provision of infant formula incurs an additional financial burden for the resource-poor community of Colesberg.

Contradictory to current literature (as previously illustrated) there was no statistical significance when the type of milk offered to this study population was compared to the prevalence of diarrhoea. In line with the instructions in the Road to Health Booklet to prevent foodborne disease,<sup>33</sup> all caregivers whose children received infant formula or other types of milk that need reconstitution, boiled and cooled the water before mixing the feeds. Ideally utensils need to be washed properly and be sanitised. Although the children whose caregivers had washed their bottles or cups before and after use were less likely to have had diarrhoea previously, there was no significant link between how often a bottle or cup was washed and the prevalence of diarrhoea. Nor was there a significant relationship found between the washing of bottles or cups with soap and water and the incidence of diarrhoea. This is in contradiction with the literature, since ideally bottles or cups should be sterilised with boiling water.<sup>76</sup>

The majority of children in this study were already consuming complementary food. The mean age (4.8 months) for starting complementary feeding was younger than the WHO recommended six months of age. In a report by the WHO it is recommended that "infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health".<sup>77</sup> Complementary feeding is often started too early or too late, and foods do not always contain all the nutrients that growing children need or are not always age appropriate; this is also common practice in South Africa.<sup>78-80</sup> A statistically significant difference was found between the consumption of complementary foods and the prevalence of diarrhoea in this study population. It

can be concluded that those children that already receive complementary feeds had a higher prevalence of diarrhoea and were therefore more likely to contract diarrhoea.

An adequate water supply, proper personal hygiene, such as washing of hands, and proper household sanitation contribute to the prevention and reduction of diarrhoea.<sup>37,61</sup> Even though it was not statistically significant, this study found those children who resided in households with access to flush toilets and those that had taps inside their houses were least likely to have experienced diarrhoea. In a publication by the WHO it was found that when hand washing with soap was done after defecation or before the preparation of food, this was shown to reduce diarrhoeal disease.<sup>61</sup>

#### **4.3.4 The knowledge, attitudes and counselling practices of nursing practitioners in managing the prevalence of diarrhoea**

According to the nested rings of responsibility of duty-bearers previously mentioned, nursing practitioners play a crucial role in health promotion to empower caregivers to fulfil their obligation of taking care of their children.<sup>3,29</sup>

The nursing practitioners expressed the opinion that if a child is 'malnourished and dirty', they are at greater risk of contracting diarrhoea. It is usually those children that arrive at the clinic already severely dehydrated. This correlates with other research conducted in South African hospitals, which found that malnutrition contributes to the morbidity and mortality of children with diarrhoea.<sup>81</sup> The nursing practitioners also mentioned that 'water is important to prevent and treat dehydration in children with diarrhoea'. The knowledge of the nursing practitioners regarding diarrhoea was correct according to the WHO/UNICEF instructions that "acute watery diarrhoea causes dehydration and contributes to malnutrition. The death of a child with acute diarrhoea is usually due to dehydration."<sup>32</sup>

Nursing practitioners agreed that water quality has an influence on the prevalence of diarrhoea. This is important knowledge for them to have since it can decide their course of action when having to deal with a diarrhoea outbreak due to microbiologically unsafe water.

The nursing practitioners as duty-bearers used the resources that were available to them to treat children with diarrhoea. The Integrated Management of Childhood Illnesses (IMCI) guidelines for the treatment of diarrhoea were followed and patients were checked for dehydration.<sup>32</sup> The IMCI guidelines also stipulate that advice about feeding and fluid replacement, as well as the danger signs of dehydration, should be provided by nursing practitioners at each consultation, not only when patients come in with diarrhoea.<sup>32,81</sup>

Nursing practitioners considered illiteracy a factor that has a great impact on caregivers' practices when dealing with water shortages and unsafe water. This places a great burden on the nursing practitioners as duty-bearers to convey simplified and correct information to caregivers, as the caregivers must be able to implement the correct treatment at home.<sup>30</sup>

According to the nursing practitioners, some of the factors that contribute to the caregivers' lack of interest and care are the poor socio-economic circumstances of community members and also the high incidence of alcohol abuse in the community. In a review by Setlalentoa et al. in 2010, the social effects of alcohol abuse were investigated and it was found that when people are unemployed, they drink to forget and to escape their circumstances. However the abuse of alcohol may also lead to unemployment. It was also found that alcohol abuse disrupts family harmony, especially when money intended for food is used to buy alcohol. This can lead to violence and poverty. When caregivers are drunk, children have to fend for themselves and this leads to child neglect and the perceived lack of interest of caregivers.<sup>82</sup>

Nursing practitioners taught the caregivers to obtain water from safe sources when there was no water available at their homes. As previously discussed, they also taught caregivers to treat their water by boiling it and to store it in clean containers. Since the local government did not fulfil their duty to provide adequate and safe water, the nursing practitioners tried their best to empower caregivers by promoting safe practices that are supported by literature.<sup>58</sup> The nursing practitioners themselves are powerless to address the water situation, but they know who the duty-bearers are that can do something about it. By conveying that message, they are fulfilling their duty.<sup>3</sup>

Nursing practitioners acted in accordance with the WHO guidelines when they explained that children could eat when suffering from diarrhoea. Some of these children might have no appetite, but food should still be offered; however a child should not be forced to eat. According to the WHO guidelines, food should not be withheld from children suffering from diarrhoea: "The aim is to give as much nutrient-rich food as the child will accept."<sup>64</sup> Children receiving treatment for diarrhoea are often malnourished and by withholding food, they can lose even more weight.<sup>81</sup>

The nursing practitioners ensured that the caregivers received the correct information with regard to preventing further episodes of diarrhoea. Before caregivers and children left the hospital or clinic, the caregivers were thoroughly counselled on a few very important topics. If it was a child that was formula fed, they explained to the mother how to mix the feeds correctly and hygienically and how to sterilise the bottles and teats. This is very important information and is vital to prevent further episodes of diarrhoea.<sup>76</sup> The caregivers were also counselled on the safe preparation of food and how to correctly store water and to boil water before use. The nursing practitioners also instructed the caregivers in personal hygiene and hand washing.

The nursing practitioners used the resources available to them and by doing that they were fulfilling their role in managing the diarrhoea of children younger than 24 months. However, nursing practitioners should ensure that they convey the correct messages to the caregivers to help them to manage diarrhoea in their children and also to help them to realise the right to water of their children.

#### **4.4 CONCLUDING STATEMENT ON DISCUSSION**

In this chapter, the quantitative and qualitative findings were discussed, as well as the role that different levels of duty-bearers play in realising the right to water of children aged 0–24 months. The role of duty-bearers during the nutritional management of diarrhoea was also addressed.

It was found that caregivers as duty-bearers were mostly fulfilling their role in realising the right to water of children aged 0–24 months, as most were doing their best with the resources available to them and to the best of their knowledge. However, a lack of knowledge regarding diarrhoea and the treatment and prevention of diarrhoea remains problematic.

It appeared that the nursing practitioners were generally fulfilling their role as duty-bearers in realising the right to water of children aged 0–24 months as they were teaching caregivers what to do with the resources available to them. However, more education with regard to the treatment and safe storage of water as well as the treatment and prevention of dehydration and diarrhoea is needed.

Local government does not fulfil its role as duty-bearer in realising the right to water of children 0–24 months. Local government is unable to provide sufficient, safe water or sufficient education.

National government has policies, programmes, guidelines and minimum standards in place to provide safe, sufficient water to the community. National government is also helping local government in fulfilling the right to water of children aged 0–24 months by upgrading the water supply system. It is the duty of national government to monitor the implementation of policies and programmes. If monitoring is improved then the government will be able to identify gaps faster and the government will be able to execute their responsibilities more efficiently. Recourse mechanisms are available, as seen in the Carolina case, but only educated communities can utilise such recourse mechanisms, provided they are aware of them.

## **CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS**



## 5.1 INTRODUCTION

In this chapter the key findings of the study are summarised and conclusions are drawn. The implications, limitations and recommendations are also discussed with regard to selected duty-bearers and whether they are fulfilling their obligations towards the realisation of the right to water of children (0–24 months) residing in Colesberg during the nutritional management of diarrhoea in primary health care institutions. The chapter concludes with the significance of the research.

### 5.1.1 Key findings from the literature survey

The literature review showed that diarrhoea is still one of the leading causes of death in children under the age of five years. Children aged 0–24 months are most vulnerable, owing to their underdeveloped immune systems – thus it is crucial to realise their right to water and health. Water is important for life and without it no one can survive. There are several human rights instruments, both national and international, that protect the right to water and health. If the right to water of children (0–24 months) is violated, it can cause diarrhoea and exacerbate malnutrition. Since the community of Colesberg are contending with water shortages and unsafe water, the role of selected duty-bearers was investigated.

## 5.2 SUMMARY OF FINDINGS AND CONCLUSIONS

The roles of various levels of duty-bearers were investigated to determine if they were fulfilling their responsibilities towards the realisation of the right to water of children (0–24 months) residing in Colesberg during the nutritional management of diarrhoea in primary health care institutions. The caregiver questionnaire and semi-structured interviews with nursing practitioners aimed to address the main research question of the study.

Being the duty-bearers closest to their children from 0 to 24 months of age, caregivers were not fully aware that they themselves were primarily responsible to realise the right to water for their children. Their perception was that it was the responsibility of the municipality (local government) to provide them with water, and they evinced no direct insight into what their own role was to guarantee this right. Some of the caregivers had the insight to pay their water and electricity bills and realised that omission to do so would incur serious consequences.

The caregivers accepted the burden of having to deal with water shortages and water of poor quality and they learned to deal with these problems. Most of them stored water to make provision for periods when there was no water available and the majority used boiled water, especially when the water was intended for their children. In this regard they dealt with the problem of no water and unsafe water, thus fulfilling the right of their children to adequate and safe water. Most of the caregivers were doing their part in realising the right of their children to water by storing water and boiling water to make it safe for human consumption.

Even though caregivers had reportedly not received advice on how to treat water, most did treat the water.

Although the nursing practitioners perceived some caregivers as irresponsible and uncaring, the caregivers also expressed their frustration and anger when there was no water available, preventing them from caring optimally for their children.

To attain the highest standard of living, houses with the necessary facilities for sanitation and infrastructure for food storage and preparation are crucial. Most of the caregivers lived in brick houses with access to taps, yet not all of them had taps in or close to their houses. Similarly, most caregivers had access to electricity that enabled them to boil water in an effective manner and store perishable foods, such as milk, correctly.

The prevalence of diarrhoea was investigated and it was found that almost half of the children in the study population had suffered from diarrhoea recently. The caregivers were not always able to

identify the reasons for the diarrhoea in children and therefore were not always able to avoid the triggers. Most of them did know that water could sometimes cause diarrhoea.

Most of the caregivers had the perception that a child with diarrhoea should receive no food or milk and in some instances not even water. This is a cause for great concern because it can lead to malnutrition and dehydration, especially in children 0–24 months; therefore it is important to continue breastfeeding and offering food during bouts of diarrhoea. Another cause for concern was the limited number of caregivers that claimed to know about the simple cost-effective oral rehydration solution to prevent and treat dehydration, which could lead to death if left untreated. At least the caregivers who knew what oral rehydration solution was, also knew how to mix it correctly.

The caregivers that took part in the study were mostly of the lower income group, but still there were many of them who opted not to exclusively breastfeed their children or in some cases not breastfed their children at all. Unfortunately this is in line with the current trend of a very low rate of exclusive breastfeeding in South Africa. Breastfed infants in this study were less likely to experience diarrhoea, which underscores the fact that breastfeeding can protect against illnesses like diarrhoea. Those children that had started eating at an earlier age were more likely to experience diarrhoea. The caregivers that had fed their children complementary foods had mostly fed their children by bottle and not by cup, as recommended by the WHO.

The caregivers had mostly practised good personal hygiene and reportedly washed their hands quite often, especially before feeding their children. The caregivers that had prepared formula feeds for their children reportedly mixed them in the correct way.

The nursing practitioners were also investigated as duty-bearers and most of them were aware of the fact that water is not always readily available in Colesberg and is of poor quality. This was regarded as a great barrier to the realisation of the child's right to water. The nursing practitioners were knowledgeable and were therefore able to manage diarrhoea in children 0–24 months. They treated diarrhoea symptomatically and they gave advice to caregivers to treat and prevent dehydration. According to the nursing practitioners, they teach caregivers how to treat water to make it safe and also how to store water safely. They teach mothers how to treat diarrhoea symptomatically with oral rehydration solution. Most of them were able to convey the correct knowledge with regard to offering food, milk and water to children with diarrhoea.

The nursing practitioners were genuinely concerned for the children and the lack of interest of caregivers was extremely problematic for them. According to the nursing practitioners, some of the factors that contribute to the caregivers' lack of interest and care are the poor socio-economic

circumstances that the majority of the people of the community live in and also the ubiquitous problem of alcohol abuse in the community.

Most of the nursing practitioners were fulfilling their role in realising the right to water of children 0–24 months.

Local government provided water to the community during water shortages but there were no contingency plans for when there was no water available. There was also no educational material or training from the local municipality. The nursing practitioners were the sole educators on how to treat and store water.

### **5.3 IMPLICATIONS OF THE STUDY**

The findings of the study hold important implications for realising the right to water of children aged 0–24 months.

- Caregivers are doing the best they can with the resources that are available to them and it is therefore important to teach them to utilise available resources as best they can.
- With the information gained, nursing practitioners will be able to streamline the information that they give to caregivers with regard to the management of diarrhoea in their children, as well as have better knowledge of treating and storing water safely.
- Local government could possibly use the results to deploy some of their resources to teach the community to save water and also how to treat and store water safely.

### **5.4 LIMITATIONS OF THE STUDY**

- The study population used for the study was relatively small ( $n=123$ ) and the study was done in a relatively isolated community; therefore it would be unwise to generalise the results for all communities in South Africa.
- Because an interpreter/translator was used, there is no way to ascertain how accurately all the information was translated and this is definitely a limitation in respect of the data gathered.
- The data collection took much longer than anticipated because of problems finding reliable translators. There were also other unforeseen problems such as a delay in obtaining ethics approval from the ethics committee, as well as from the Department of Health.
- Because of this the data collection did not take place during the months when the incidence of diarrhoea is higher; therefore it could appear that diarrhoea is not problematic in Colesberg.

- It would have been beneficial to investigate more duty-bearers, but owing to the political instability at the time when the protocol was written, just before the national election, the researcher decided not to include other duty-bearers, for example, officials from the local municipality.

## 5.5 RECOMMENDATIONS

In this section recommendations are made to help duty-bearers to fulfil their role in realising the right to water of children 0–24 months during the nutritional management of diarrhoea.

- Caregivers need more focused advice and instructions on how to treat water to make it safer for human consumption.
- Caregivers need more focused advice and instructions on how to store water safely.
- Health education and promotion should not only be focused on caregivers but should also be focused on the broader community. Church groups can be targeted to relay information about saving water and how to treat water to make it safe.
- Caregivers should be taught by officials from the local government how to save water in order to preserve resources.
- Caregivers should be taught efficient personal and household hygiene.
- Caregivers should receive education on how to prevent diarrhoea and also how to treat and prevent dehydration.
- Caregivers should receive education with regard to best practice for the management of diarrhoea, especially in respect of what children may eat and drink while experiencing diarrhoea.
- Caregivers should receive sufficient knowledge for sustainable breastfeeding and be taught the advantages of breastfeeding.
- Caregivers opting to use infant formula should be taught how to prepare and store milk hygienically, how to mix it properly, and to feed by cup, rather than by bottle.
- Caregivers should be advised to report problems with their water supply or any issues they have with regards to the safety of the water to the local authorities.
- Peer educators at the clinic can be educated to educate patients that visit the clinic.
- The local municipality should put programmes in place to teach the community how to save water, how to treat water to make it safe and to whom to report problems when they arise.

Recommendations for further research:

- It could be useful to do further studies that examine in greater depth the protective mechanism of breastfeeding on the prevalence of diarrhoea.
- Future studies could also be done to compare different areas (informal settlements, Reconstruction and Development Programme housing, and formal brick dwellings) and how the right to water of children is affected in these categories.
- Further studies to investigate the role of local government as duty-bearers could also be beneficial.

## **5.6 SIGNIFICANCE OF THE RESEARCH**

The findings of this study can make a contribution to the discipline of nutrition and dietetics, where there is currently limited research in the field of the right to water of children and the effect that the denial of this right has on their health. It sheds light on the knowledge, practices and attitudes of a selected study sample of caregivers and nursing practitioners as duty-bearers. It also identifies the gaps in their knowledge.

On a more personal level, the researcher gained valuable experience that will be shared with other dietetic professionals and the Department of Health in the Northern Cape.

## **5.7 CONCLUSION**

It can be concluded that caregivers and nursing practitioners, as duty bearers, are fulfilling their role, as far as it is in their power, towards the realisation of the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions. It was found that other factors contribute to their not realising the right to water of children 0–24 months, such as intermittent water supply, poor quality of water, and a lack of information on how to treat water to make it safe and potable.

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## **APPENDICES**

**Appendix A: Screening questions: caregivers**

<b>CODE</b> <b>CG/LC1.....</b> <b>CG/KC1.....</b>
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The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions.

<b>1. SCREENING QUESTIONS:</b>						
<b>a. Date of birth of child</b> .....year.....months	D	D	M	M	Y	Y
<b>b. What language do you speak?</b>	1 Afrikaans	2 English	3 isiXhosa	4 Other: .....		
<b>c. Do you live in the Umsobomvu district?</b>	1 Yes			2 No		
<b>d. How long have you lived in the above-mentioned district?</b>	1 More than 1 year			2 Less than 1 year		
<b>e. What is your relationship to the child?</b>	1 Biological mother		2 Caregiver (more than 3 days a week)		3 Foster mother	
<b>f. Do you have the child's Road to Health Booklet/clinic card with you?</b>	1 Yes			2 No		

If the candidate complies with the criteria, please obtain written, informed consent and continue with the questionnaire.



## **Appendix B: Caregiver consent form (English)**

### **PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM**

#### **TITLE OF THE RESEARCH PROJECT:**

The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions.

**REFERENCE NUMBER:** S13/05/108

**PRINCIPAL INVESTIGATOR:** Susanna Snyman

#### **ADDRESS:**

PO Box 33  
Colesberg  
9795

**CONTACT NUMBER:** 051 - 7539300

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the investigator any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say 'no', this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice, and the Medical Research Council (MRC) Ethical Guidelines for Research.

#### **What is this research study all about?**

- This research study will be done in two clinics in Colesberg and in one clinic in Norvalspont. In total, 122 people will be selected to take part in the study.
- This research study will be done to determine the role of caregivers and nursing practitioners in providing enough and safe water to children (0–24 months). We also want to determine what type of advice is given to caregivers at the clinic when their children have diarrhoea.
- We only need some of your time to complete a questionnaire. The investigator or interpreter will go through the questions with you and will fill in your answers on the questionnaire.
- The results of the research will be made available to the Department of Health and a brief summary will be made available to anyone who is interested to know the results.

#### **Why have you been invited to participate?**

- You have been selected to participate because you are at the clinic today. Every second caregiver with a child younger than 24 months is invited to participate in this study.

#### **What will your responsibilities be?**

- All we need is to have a look at the Road to Health Booklet (clinic card) of the child and for you to answer some questions. The questionnaire will take approximately 10–15 minutes to complete.

#### **Will you benefit from taking part in this research?**

- In future children might benefit from this research when caregivers will receive clearer information on how to prevent and treat diarrhoea in children.

#### **Are there any risks involved in your taking part in this research?**

- There are no risks involved in taking part in this study.

### Who will have access to your information?

- Only the researcher will see your answers and nobody else. All information will be kept secret. Nobody else will know that you completed the questionnaire.

### Will you be paid to take part in this study and are there any costs involved?

- No, you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.

### Is there anything else that you should know or do?

- You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by the researcher.
- You will receive a copy of this information and consent form for your own records.

### Declaration by participant

By signing below, I ..... agree to take part in a research study titled: "The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions".

I declare that:

- I have read or have had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

Signed at (*place*) ..... on (*date*) ..... 2014.

.....  
Signature of participant

.....  
Signature of witness

### Declaration by investigator

I (*name*) ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and take adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
- I did/did not use an interpreter. (*If an interpreter is used, the interpreter must sign the declaration below.*)

Signed at (*place*) ..... on (*date*) ..... 2014.

.....  
Signature of investigator

.....  
Signature of witness

### Declaration by interpreter

I (*name*) ..... declare that:

- I assisted the investigator (*name*) ..... to explain the information in this document to (*name*) of (*participant*)

..... using the language medium of Afrikaans/isiXhosa.

- I encouraged him/her to ask questions and take adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her questions satisfactorily answered.

Signed at (*place*) ..... on (*date*) .....

.....

**Signature of interpreter**

.....

**Signature of witness**

**Appendix C: Questionnaire Caregivers (English)****CODE****CG/LC/1.....****CG/KC/1.....****CG/NC/1.....**

The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions.

<b>1. DEMOGRAPHIC QUESTIONS</b>							
<b>a. Where in Colesberg do you live?</b>	1		2		3		
	Town .....		Farm .....		Informal settlement .....		
<b>b. Date of birth of child .....year.....months</b>	D	D	M	M	Y	Y	
<b>c. Date of birth of caregiver</b>	D	D	M	M	Y	Y	
<b>d. What is your relationship to the child?</b>	1		2		3		
	Biological mother		Caregiver (more than 3 days a week)		Foster mother		
<b>e. What is your highest level of education?</b>	1		2		3		
	Primary .....		Secondary .....		Tertiary .....		
<b>f. How many children do you have and what are their ages?</b>	..... .....						
<b>g. Are you employed?</b>	1			2			
	Yes			No			
<b>h. What is your average monthly income?</b>							

<b>2. GENERAL HOUSEHOLD INFORMATION</b>				
<b>a. Do you have electricity in your home?</b>	1		2	
	Yes		No	
<b>b. Resources</b>	1	2	3	4
	Fridge	Stove	Electric kettle	Microwave oven

<b>c. What type of fuel does the household mostly use for cooking of food?</b>	1 Electricity	2 Gas	3 Paraffin	4 Wood/ open fire inside house	5 Wood/open fire outside house
<b>d. Sanitation facilities</b>	1 Toilet inside the house		2 Toilet outside: Flush		3 Toilet outside: Pit latrine
<b>e. Where does the household usually get its drinking water from?</b>	Tap inside the house <sup>1</sup>	Tap outside the house <sup>2</sup>	Neighbour's tap <sup>3</sup>	Public tap <sup>4</sup>	Other <sup>5</sup> specify .....
<b>f. Do you think that the water from your taps is safe? (Clean and drinkable.)</b>	1 Yes		2 No		3 Don't know
<b>g. If no, why not?</b>	..... ..... ..... .....				
<b>h. Has anyone ever told you how to treat your water to make it safe?</b>	1 Yes		2 No		
<b>i. What do you do when the water is not clean enough to drink?</b>	..... ..... .....				
<b>j. What do you do when there is no water?</b>	..... ..... ..... .....				
<b>k. How do you feel when there is no water?</b> <i>(Prompt: Does it affect your child?)</i>	..... ..... ..... ..... .....				
<b>l. Do you think that it is your basic human right to have/have access to water? Why?</b>	1 Yes		2 No		3 Don't know

<b>l.1 Why do you think it is or isn't your right to have water?</b>	..... ..... .....		
<b>m. Which people or organisations do you think are supposed to make sure that you have water?</b> <b>What do you think your responsibilities are in accessing water?</b>	..... ..... ..... .....		
<b>n. What does your child drink when there is no clean water?</b>	..... ..... .....		
<b>o. How do you prepare food when there is no water?</b>	..... ..... .....		
<b>p. Do you sometimes need to store water?</b>	1 Yes	2 No	
<b>q. If yes, how do you store water?</b>	..... ..... .....		
<b>r. Do you boil the water before you use it?</b>	1 Never	2 Sometimes	3 Always
<b>s. If yes/no to question (r), why?</b>	..... ..... .....		
<b>t. Do you treat the water in any way before you use it?</b>	..... ..... .....		
<b>u. If yes/no to question (t), why?</b>	..... .....		
<b>v. When do you wash your hands? Name all occasions.</b>	..... ..... .....		
<b>w. With what do you wash your hands?</b>	1 Only with water	2 With soap and water	

3. NUTRITIONAL INFORMATION			
a. What type of milk is your child currently drinking? (More than one can be applicable.)	1 Breast milk	2 Formula milk .....	3 Cow's milk
	4 Other .....		
a.1 Was the child breastfed previously?	1 Yes		2 No
a.2 Until what age did you breastfeed your child?			N/A
b. If you breastfeed, do you express milk?	1 Yes	2 No	3 N/A
c. If yes to (b), where do you store expressed breast milk?	..... .....		
d. If yes to (b) for how long do you store expressed breast milk?	..... ..... .....		
e. If 6 months or younger: Do you give anything else? (Gripe water/tea/porridge/formula milk)	1 Yes Specify .....	2 No	
f. If you give formula milk: How do you prepare the milk?	..... ..... ..... .....		
g. With what do you give milk to your child?	1 Bottle	2 Cup	3 Other .....
g.1 Do you boil the water before you make the milk?	1 Yes		2 No
g.2 Do you let the water cool down before you use it?	1 Yes		2 No

<b>g.3 What container do you use to let the water cool down in?</b>	..... .....		
<b>g.4 Where do you store mixed formula milk?</b>	..... .....		
<b>g.5 For how long do you store mixed formula milk? (Hours/days)</b>	..... .....		
<b>g.6 How often do you wash your baby's bottle?</b>	1 Before and after use	2 After use	3 Only once a day
<b>g.7 With what do you wash your baby's bottle?</b>	1 Only with water	2 With soap and water	3 With Jik/Milton
<b>g.8 What do you do with the leftover milk (formula/expressed BM)?</b>	..... ..... .....		
<b>h. Do you give other food (than milk) to your child?</b>	1 Yes	2 No	
<b>i. If yes, at what age did your child start to eat solids/other food?</b>	.....months		
<b>j. Should a child receive food if he/she has diarrhoea?</b>	1 Yes	2 No	3 Don't know
<b>k. If yes, what type of food do you give to your child when he/she has diarrhoea?</b>	..... ..... .....		
<b>l. Should a child receive milk if he/she has diarrhoea?</b>	1 Yes	2 No	3 Don't know
<b>m. May your child drink water when he/she has diarrhoea?</b>	1 Yes	2 No	3 Don't know

<b>4. INFORMATION ON CHILD MORBIDITY</b>			
<b>a. Had this child received all of the rotavirus immunisations? (Look in RTHB)</b>	1 Yes	2 No	3 Don't know
<b>b. What do you think diarrhoea is?</b>	..... ..... .....		



<b>c. What is the main reason for taking your child to the clinic?</b>		1  Weighing	2  When immunisation is due	3  When the child is ill	4  Other		
<b>d. Does your child have any chronic illnesses?</b>		1  Yes		2  No			
<b>e. If yes to (d): What chronic illness?</b>					N/A		
<b>f. Did your child have any illness in the last 4 weeks? If any, when?</b>  .....		1  No	2  Respiratory infection	3  More than 4 watery stools in 24h	4  Fever	5  Poor appetite	6  Other ..... ..... ..... .....
<b>g. When was the last time that this child had diarrhoea/loose or watery stools?</b>		1  Days .....	2  Weeks .....	3  Other .....			
<b>h. How often does this child have diarrhoea/loose or watery stools? (Check RTHB as well)</b>		1  Weekly	2  Biweekly	3  Monthly	4  Other ..... .....		
<b>i. Do you know why a child gets diarrhoea?</b>			1  Yes	2  No			
<b>j. If yes, what is the reason? If no, what do you think?</b>		..... ..... ..... ..... .....					
<b>k. Do you know what Oral Rehydration Solution is? (Hint: sugar/salt solution for diarrhoea)</b>			1  Yes	2  No			

<p><b>l. If yes, can you explain to me how to mix it? (tick off)</b></p> <ul style="list-style-type: none"> <li>• 1 litre of cooled, boiled water</li> <li>• 8 level teaspoons of sugar</li> <li>• ½ a teaspoon of salt (level)</li> <li>• Give after every loose stool</li> </ul>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p><b>m. What does the clinic sister teach you to do if your child has diarrhoea?</b></p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p><b>n. What do others in the community tell you to do when your child has diarrhoea?</b></p>	<p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

Thank you very much for your participation. All information will be handled confidentially.

## **Appendix D: Consent form: Nursing Practitioners (English)**

### **PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM**

#### **TITLE OF THE RESEARCH PROJECT:**

The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions.

**REFERENCE NUMBER:** S13/05/108

**PRINCIPAL INVESTIGATOR:** Susanna Snyman

#### **ADDRESS:**

PO Box 33  
Colesberg  
9795

**CONTACT NUMBER:** 051 - 7539300

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the investigator any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice, and the Medical Research Council (MRC) Ethical Guidelines for Research.

#### **What is this research study all about?**

- This research study will be conducted at Lowryville Clinic, Kuyasa Clinic, Manne Dipico Hospital and Norvalspont Clinic. In total, 4–8 available participants will be selected to take part in the study.
- **This research study will be conducted to determine the role of caregivers and nursing practitioners in providing enough and safe water to children younger than 24 months and to determine what type of advice is given to caregivers at the clinic when their children have diarrhoea.**
- The results of the research will be made available to the Department of Health and a brief summary will be made available to anyone who is interested to know the results.

#### **Why have you been invited to participate?**

- Nursing practitioners responsible for the treatment of children younger than 24 months will be invited to participate in the study.
- At each facility 1–2 nursing practitioners will be selected to participate in the study. Participation will be completely voluntary.

#### **What will your responsibilities be?**

- All we require is that you set aside some time to be interviewed and provide the necessary information. The interview will take approximately 30–45 minutes.

- Your permission is required, as the interview needs to be voice recorded. The recording will be transcribed for the purpose of further analysis of information obtained from all participants.

#### **Will you benefit from taking part in this research?**

- Future patients may benefit from this research as it may lead to an improvement in the type of information provided to caregivers during water shortages and times of poor water quality to prevent and treat diarrhoea in children.

#### **Are there any risks involved in your taking part in this research?**

- There are no risks involved in taking part in this study.
- The voice recordings will be password protected and destroyed after transcription. Only the researcher will have access to the recording and the transcribed text.

#### **Who will have access to your information?**

- The interview will be confidential and only the investigator will know who participated in the study. All data will be handled confidentially. The results of the study will be published but no names or names of facilities will be made public.

#### **Will you be paid to take part in this study and are there any costs involved?**

- No, you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.

#### **Is there anything else that you should know or do?**

- You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by the researcher.
- You will receive a copy of this information and consent form for your own records.

#### **Declaration by participant**

By signing below, I ..... agree to take part in a research study titled: "The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions".

I declare that:

- I have read or have had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

Signed at (*place*) ..... on (*date*) ..... 2014.

.....  
**Signature of participant**

.....  
**Signature of witness**

### Informed consent for the taping of the interview

I understand that this interview will be voice recorded to enable the researcher to accurately transcribe the interview. It has been explained to me that the recordings and all electronic documents will be stored safely and destroyed after six months of completion of the research. I was given the opportunity to ask questions and all queries were explained to my satisfaction. I have been given a copy of the consent form.

.....  
Participant name (Printed)

.....  
Date of birth

.....  
**Signature of participant**

.....  
**Date**

### Declaration by investigator

I (*name*) ..... declare that:

- I explained the information in this document to .....
- I encouraged him/her to ask questions and take adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above

Signed at (*place*) ..... on (*date*) ..... 2014.

.....  
**Signature of investigator**

.....  
**Signature of witness**

## **Appendix E: Interview Schedule: Nursing Practitioners**

**Die rol van geselekteerde rolspelers om die reg tot water vir kinders (0–24 maande) te verwesenlik in Colesberg, Noord-Kaap, gedurende die voedings hantering van diarree in primêre gesondheidsorg fasiliteite.**

*Die doel van hierdie gesprek is om vas te stel watter rol u as verpleegkundige speel met betrekking tot die voorkoming en behandeling van diarree in kinders wanneer daar nie genoeg en veilige water beskikbaar is nie.*

### **1. Inleiding**

1.1 Wat is u posbeskrywing?

1.2 Hoe gereeld behandel u kinders?

1.3 Vertel asb wat u persoonlike ervaring is met die hantering van kinders (0-24 mnede) met diarree.

### **2. Die rol van water in gesonde voeding**

2.1 Na u mening, watter rol speel water in die voeding van kinders?

2.2 Tot watter mate dink u beïnvloed die waterkwaliteit die voeding van die kinders in hierdie gemeenskap? (*Opvolg: Watter verband het u waargeneem tussen die voorkoms van water kwaliteit en hierdie kinders se voedingstatus?*)

2.3 Verduidelik asb hoedat die hoeveelheid water wat beskikbaar is die mense in die gemeenskap se vermoë om kos te maak beïnvloed?

2.4 Wat doen die gemeenskap as daar nie genoeg en veilige water is vir kosmaak en drinkwater nie, om te sorg vir die kinders 0–24 maande?

### **3. Water as 'n mensereg**

3.1 Wat is u mening oor menseregte oor die algemeen?

3.2 Is die reg tot water 'n mensereg? Verduidelik asb?

Indien JA vir 3.2: Dink u dat die mense van die gemeenskap se reg tot water beïnvloed word? Verduidelik asb.

3.3 Wie se plig is dit om water aan die gemeenskap te voorsien?

- *Opvolg: Het die gemeenskap die vrymoedigheid om enige probleme tov hoeveelheid of kwaliteit van water met bogenoemde instansie te bespreek / rapporteer?*
- *Watter aksies volg indien die gemeenskap probleme sou rapporteer?*

3.4 Verduidelik asb tot watter mate bogenoemde liggaam/ instansie hul plig nakom om genoeg en veilige water aan die gemeenskap te voorsien?

- *Opvolg: Kan hierdie liggaam/instansie meer doen? Waarom? Wat kan hulle meer doen?*

3.5 Is daar enigiets wat die gemeenskap self kan doen om te verseker dat hul water voldoende en veilig is? Verduidelik asb.

#### **4. Die rol van water m.b.t. die voorkoms van diarree**

4.1 Dink u dat water in hierdie gemeenskap diarree kan veroorsaak? Verduidelik asb.

4.2 In die kliniek, is daar riglyne beskikbaar wat verpleegkundiges kan volg tydens die behandeling van diarree by kinders?

- *Opvolg: Bv 'n protokol /SOP wat spesifiek betrekking het op behandeling van diarree? Verduidelik asb waar kom die riglyne vandaan?*
- *Is hierdie riglyne volgens u mening voldoende? Verduidelik asb.*
- *Kry verpleegkundiges enigsins opleiding in die gebruik van hierdie riglyne? Wanneer?*

4.3 Gee u enige raad aan die versorger van 'n kind wat diarree het?

- *Opvolg: Verduidelik asb stapsgewys.*
- *Watter raad word gegee om te voorkom dat die kind dehidreer?*
- *Watter raad word gegee om voedsel op 'n veilige manier voor te berei, om voedselvergiftiging te voorkom*
- *Watter raad word gegee oor persoonlike higiëne en die voorkoming van diarree?*
- *Watter raad word gegee oor die beveiliging van water en die veilige stoor van water?*

4.4 Wat is u mening oor die inname van voedsel en vloeistof wanneer 'n kind diarree het?

- *Opvolg: Tot watter mate is die versorgers bekommerd daaroor dat diarree hulle kinders se voedingstatus beïnvloed?*

4.5 Is daar enige ander kommentaar wat u het oor die reg van die kind tot genoeg en veilige water?

*Baie dankie vir u deelname en hierdie waardevolle inligting.*

## Appendix F: Letter from Health Research Ethics Committee



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jou kennisvennoot • your knowledge partner

### Approved with Stipulations Response to Modifications- (New Application)

04-Sep-2013  
Snyman, Susanna S

Ethics Reference #: S13/05/108

Title: The role of selected duty bearers in realising the right to water of children (0-24 months ) in Colesberg Northern Cape during the nutritional management of diarrhoea in primary health care institution

Dear Ms Susanna Snyman,

The **Response to Modifications - (New Application)** received on 30-Aug-2013, was reviewed by members of **Health Research Ethics Committee 2** via Expedited review procedures on 02-Sep-2013.

Please note the following information about your approved research protocol:

Protocol Approval Period: 02-Sep-2013 -02-Sep-2014

The Stipulations of your ethics approval are as follows:

1. Feedback to participants cannot be in the form of a scientific publication & should be tailored to their needs in an accessible & understandable medium e.g. layperson summary/ or oral feedback.

Please remember to use your protocol number (S13/05/108) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

#### After Ethical Review:

Please note a template of the progress report is obtainable on [www.sun.ac.za/rds](http://www.sun.ac.za/rds) and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372  
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

#### Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health ([healthres@pgwc.gov.za](mailto:healthres@pgwc.gov.za) Tel: +27 21 483 9907) and Dr Helene Visser at City Health ([Helene.Visser@capetown.gov.za](mailto:Helene.Visser@capetown.gov.za) Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.  
For standard HREC forms and documents please visit: [www.sun.ac.za/rds](http://www.sun.ac.za/rds)

If you have any questions or need further assistance, please contact the HREC office at 0219389207.

#### Included Documents:

addendum F  
applic form  
dec letter snyman  
cov letter



addendum L  
cv marais  
addendum B  
dec letter marais  
cv snyman  
addendum C  
protocol  
addendum J  
addendum A  
addendum M  
addendum G  
synopsis  
addendum D  
checklist  
dec letter koen  
addendum I  
cv koen  
addendum N  
addendum H  
addendum K

Sincerely,

Mertrude Davids  
HREC Coordinator  
Health Research Ethics Committee 2

## **Appendix G: Letter for consent: Department of Health, Pixley Ka Seme District**

PO Box 33  
COLESBERG  
9795  
10 September 2013

M Eckard  
Pixley Ka Seme District Office  
De Aar

Mrs M Eckard

### **REQUEST FOR CONSENT TO CONDUCT RESEARCH STUDY IN UMSOBOMVU SUB-DISTRICT, PIXLEY KA SEME DISTRICT, NORTHERN CAPE**

I, Susanna Snyman, am currently a registered Master's of Nutrition student at Stellenbosch University. I hereby request approval to conduct my research in the Umsobomvu sub-district of the Pixley Ka Seme District of the Northern Cape.

The title of my research is: "The role of selected duty-bearers in realising the right to water of children (0–24 months) in Colesberg, Northern Cape, during the nutritional management of diarrhoea in primary health care institutions". Ethical approval has been obtained from the Health Research Ethics Committee at Stellenbosch University. [Reference number: S13/05/108]

I propose to conduct research at the following clinics in the Colesberg area: Lowryville, Kuyasa and Norvalspont and also at Manne Dipico Hospital in Colesberg. The pilot study will be conducted in Simon Zono Clinic and Eurekaclinic in Noupoot. The study will consist of two parts.

The first part requires that questionnaires be completed by caregivers of children 0–24 months who visit the relevant clinics on the days of data collection. The aim is to collect data on the practices and knowledge of caregivers regarding the management of diarrhoea, infant feeding practices, treatment and storage of drinking water and water for household use, as well as their personal hygiene and household sanitation. The perceptions of caregivers of children 0–24 months of their barriers to the realisation of the right to safe, drinking water/health, will also be investigated by means of the questionnaire.

The second part will entail in-depth interviews with nursing practitioners at the relevant clinics and at the hospital to determine the knowledge, attitudes and counselling practices of nursing practitioners in managing the incidence of diarrhoea and also their perceptions of the barriers to help realising a child's right to health. The interviews with the nursing practitioners will last approximately an hour. A suitable time for the interviews will be arranged with the nursing practitioners to ensure their productivity will not be affected.

All information obtained will be treated confidentially and all questionnaires and interviews will receive participant codes during analysis of data, to maintain anonymity.

The pilot study will be conducted during September 2013 and data collection will take place during October and November 2013.

This study should provide valuable information which can be utilised by health professionals. The findings of the research will be made available to the Department of Health.

I should also like to request permission to publish an article with my findings in a scientific peer-reviewed journal.

I should appreciate it if you would consider my request favourably.

Yours faithfully

Susanna Snyman  
Dietician: Colesberg